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PREPARE FOR GROWTH

How ERP Systems Help Organizations
Meet The Future With Greater
Strength & Flexibility





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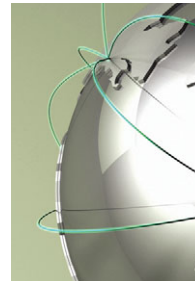
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ON THE COVER



ERP (enterprise resource planning) systems are designed to help you better manage data across your entire organization, but problems in the past have left many stigmas attached to ERP. It is, however, a fit for every organization, and there's a good chance you already have some form of it in place. Turn to the Essential Business Tech department to learn more about how ERP has evolved and how a full-fledged implementation can help your business.

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Business Tech*

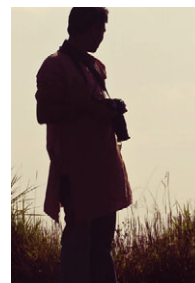
Technology
intelligence
for executives,
professionals,
and entrepreneurs



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➤ *Mobile
Office*

Solutions that
help businesses
make the most of
mobile devices
and services



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➤ *Personal
Electronics*

Electronics,
services, and
helpful advice
for home
and leisure



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SECURITY APPLIANCE MARKET GROWTH SLOWED IN 2012

► Factory revenues from and actual shipments of security appliances grew at a slower rate in Q3 2012 than in the previous quarter, according to an IDC release. In terms of factory revenues, the research firm reported 5.7% year-to-year growth in Q3 2012 compared to 6.6% year-to-year growth in the previous quarter. For greater context, John Grady, IDC research manager for security products, acknowledged that “the security market remains more resilient than others” and added that “the evolving threat landscape continues to drive spending on security products as organizations battle to keep their infrastructures secure and their data protected.” IDC did not offer a prediction for the market at this time.

GROWTH EXPECTED IN CONVERGED INFRASTRUCTURE MARKET

► A new report from Technology Business Research indicates the server market has received an ongoing boost from companies moving their data centers to converged infrastructure, which combines servers, storage, networking, and other hardware into single, more efficient solutions. The trend toward virtualization has negatively impacted the server market, and TBR expects the overall server market to remain flat, but vendors offering products for converged infrastructure are outpacing the market, according to TBR. “Customers might not find particular value in a certain server model or storage array when sold separately, but when integrated into a preconfigured stack designed to quickly handle specific workloads, the value becomes apparent for customers that don’t have the time or skills necessary to deploy and manage individual components,” says Christian Perry, senior analyst for data centers with TBR.

BIG DATA TO BECOME A \$23.8B INDUSTRY IN 2016

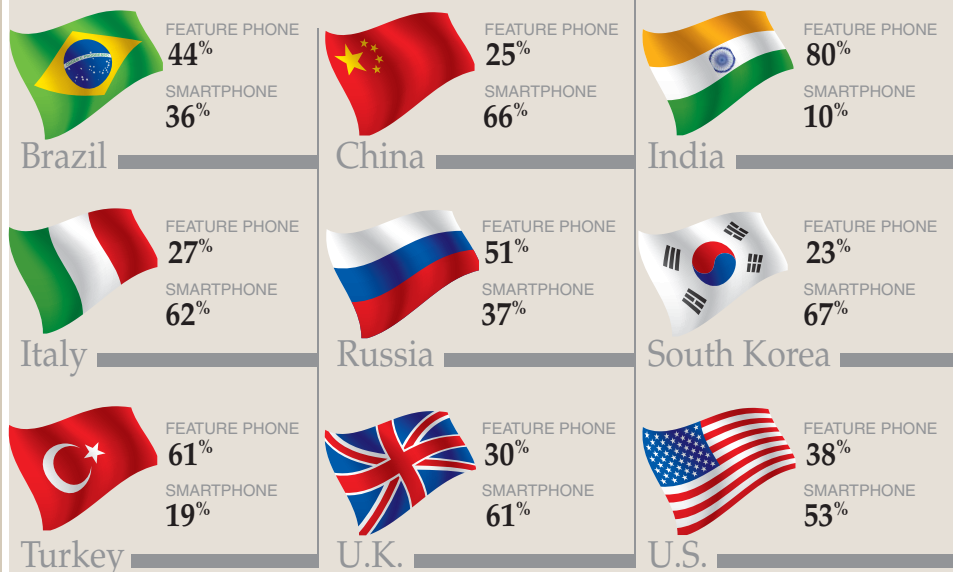
► Over the next three years, technology and services related to big data will increase at a compound annual growth rate of 31.7% to become a \$23.8 billion industry in 2016, according to research firm IDC. The big data market, which includes related infrastructure and services, “is an important topic on many executive agendas and presents some of the most attractive job opportunities for people with the right technology, analytics, communication, and industry domain expertise,” says Dan Vessett, vice president for IDC business analytics and big data research. Storage represents a large percentage of the infrastructure component of big data technology, says IDC, as companies continue to amass potentially usable unstructured data.

MOBILE BANKING USAGE TO CROSS BILLION MARK IN 2017

► According to the latest Juniper Research report on mobile banking, only about 590 million people worldwide used mobile banking services on their phones, but in 2017 that number is projected to surpass the billion mark. That number will represent “just under 15% of the mobile subscriber base,” according to Juniper. “From the banks’ perspective the triple play platform [of messaging, mobile browser, and app] is advantageous as it avoids them having to switch suppliers for different approaches as well as maximizing client reach,” says Nitin Bhas, senior analyst with Juniper Research.

SMARTPHONES VS. FEATURE PHONES IN WORLDWIDE USAGE

► Nielsen recently released a report detailing how people use their mobile phones around the world. Included in the report was a look at the types of phones in use. This chart compares the percentages of the populations of various countries that use smartphones vs. feature phones, or mobile phones that have smartphone-like features but lack a full-fledged smartphone OS.



TABLET COMPUTER OWNERSHIP INCREASING QUICKLY

► Consumers are opting for tablet computers, sometimes at the expense of laptops or desktop PCs, at a quickening pace. The Consumer Electronics Association reports that 38% of U.S. consumers owned tablets in Q4 2012, up from 31% in Q3. "As we begin 2013, anticipation is high for the next wave of tablets to include features such as high-resolution displays, improved graphic capabilities, near field communications, and thinner and lighter chassis," said Kevin Tillmann, senior research analyst for the CEA, in January. IDC reported that worldwide tablet shipments are increasing sharply, as well. The research firm reported approximately 52.5 million tablets shipped in Q4 2012, which amounts to a 75.3% year-over-year increase as 29.2 million units shipped in Q4 2011.

BIG DATA FOR SALE . . . TO PAY FOR BIG DATA

► As organizations store more data, the costs associated with storing that data often rise. Therefore, according to new research from Gartner, it's likely that businesses will begin considering ways of monetizing their stored data in order to counteract those rising costs. "For example," says Doug Laney, research vice president at Gartner, "several retailers are already generating millions of dollars per year in incremental revenue by placing online their point-of-sale and other data for business partners to subscribe to." Laney's recommendation to businesses and consumers alike is to "recognize that their personal usage, location, profile and activity data has a tangible market value. They should guard it and ensure that when they do share it they receive ample services, products or cash for it."

MORE SOFTWARE VULNERABILITIES REPORTED IN 2012

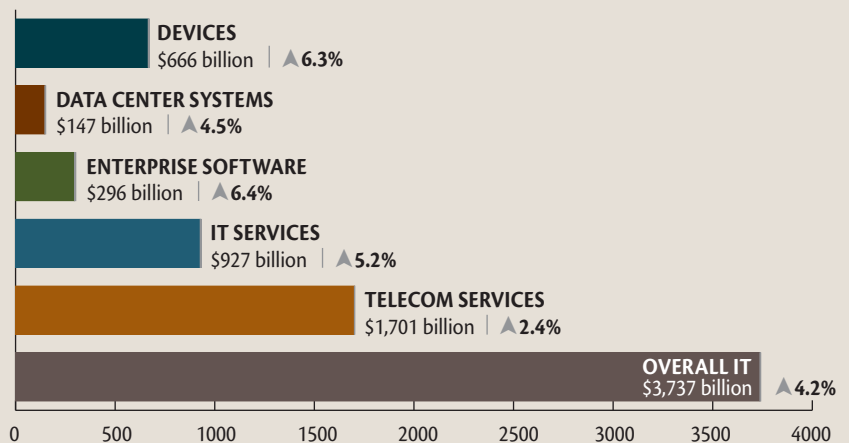
► The number of software vulnerabilities that are disclosed jumped 26% last year after five years of declines. The data, released in a new report from security research and advisory firm NSS Labs, comes in spite of continued investments in secure software made across the software industry. Vulnerabilities in information control and SCADA (supervisory control and data acquisition) systems, which control processes such as electrical grids and water supplies, almost doubled between 2011 and 2012 and are up 600% since 2010, NSS Labs reports. Although the number of vendors affected continues to expand—73% of vulnerabilities disclosed last year were from new vendors that did not have a disclosure the previous two years—1% of vendors accounted for 31% of all the vulnerabilities last year.

ENTREPRENEURS INTEND TO HIRE MORE IN 2013

► More than half (54%) of the "600 plus major entrepreneurs" surveyed for Ernst & Young's latest report on global jobs creation said they plan to expand their workforce in 2013. Most of those surveyed (74%) also said they had increased headcount in 2012. Looking forward, innovation is what these entrepreneurs are after, and 90% of them feel that innovation is a key differentiator between their businesses and the competition, according to Ernst & Young. And when it comes to applying that innovation, 44% reported having a "structured process in place to drive innovation," while 41% viewed innovation as relying more on spontaneity.

WORLDWIDE IT SPENDING EDGING UP IN 2013

► Research firm Gartner projects that worldwide IT spending will increase 4.2% this year, from \$3.6 trillion in 2012 to \$3.7 trillion in 2013. Gartner analysts point out that foreign currency value gains are responsible for part of this increase; using constant dollars, we would see a 3.9% increase. Regarding concerns related to the economy that have caused uncertainty and "pessimistic business and consumer sentiment," Richard Gordon, managing vice president with Gartner, says, "much of this uncertainty is nearing resolution, and as it does, we look for accelerated spending growth in 2013 compared to 2012." This chart shows Gartner's spending forecast and percentage growth for 2013.



WHO USES SOCIAL MEDIA?

► If you're thinking "almost everyone," you're on the right track. The Pew Research Center's social media demographics report for 2012 revealed that 67% of Internet users use at least one social networking site. The go-to site is typically Facebook (67% of Internet users also use Facebook), which holds a vast lead over second-place Twitter (16%), third-place Pinterest (15%), and fourth-place Instagram (13%). Here's how social media usage breaks down by gender, age, and income level; figures are percentages of all Internet users in a given category.

GENDER

62% - Men

71% - Women

AGE

83% - Age 18-29

77% - Age 30-49

52% - Age 50-64

32% - Age 65+

ANNUAL HOUSEHOLD INCOME

72% - Less than \$30,000

65% - \$30,000-\$49,999

66% - \$50,000-\$74,999

66% - \$75,000+

BI MARKET HAS "UNMET DEMAND"

► Worldwide sales of BI (business intelligence) software should be up 7% this year, according to Gartner. "Although this is a mature market and has been a top CIO priority for years, there is still a lot of unmet demand. Every company has numerous subject areas . . . that have yet to even start with BI and analytics," says Kurt Schlegel, research vice president at Gartner. Gartner analysts expect that BI and analytics platforms will remain one of the fastest-growing software markets, although near-term growth could be slowed by a sluggish economy and a smaller number of multimillion-dollar BI deals.

SOCIAL-INFORMATION-MOBILE-CLOUD KEY TO SUCCESS, GARTNER SAYS

► The convergence of four elements—social media, information, mobile, and cloud—form what research firm Gartner terms the "Nexus of Forces," claiming that this combination "is what drives real business value." Based on research included in a recent report, Gartner urges organizations to view these four factors as pieces of the same puzzle. Frank Ridder, research vice president, says "sourcing managers must take a more holistic approach and understand wider IT service market trends . . . rather than considering each factor as a separate trend." Among Gartner's suggestions: improve service integration capabilities to accommodate inclusion of cloud services; channel social technologies for collaboration; and accept and leverage the use of consumer devices in the workplace.

LTE GAINING MOMENTUM

► The LTE market has shown significant growth over the past 12 months, according to Juniper Research. The momentum has been primarily dominated by enterprises, but consumer subscribers are expected to sign up in volume this year, Juniper data shows. Revenues from 4G LTE are expected to reach \$340 billion by 2017. About 70% of LTE revenues will come in the North America, Far Eastern, and China markets. Timing of availability and the cost of the spectrum are two major factors in the speed of LTE rollouts, Juniper reports, as 4G LTE investments can take several years to recoup.

WHAT ARE YOUR PRIORITIES?

► With IT budgets expected to be essentially flat for the fifth straight year, analysts at research group Gartner say it is time to evolve your IT strategies, priorities, and plans beyond tending to the usual concerns and work to increase technology's potential in the enterprise. "CIOs require a new agenda that incorporates hunting for new digital innovations and opportunities and harvesting value from products, services, and operations," says Mark McDonald, group vice president and Gartner fellow.

Here are the top 10 technology priorities for 2013, according to Gartner:

1. Analytics and business intelligence
2. Mobile technologies
3. Cloud computing (SaaS, IaaS, PaaS)
4. Collaboration technologies (workflow)
5. Legacy modernization
6. IT management
7. CRM
8. Virtualization
9. Security
10. ERP applications

"In a world of change, it is concerning that around half of CIOs surveyed do not see IT's enterprise role changing over the next three years," McDonald says. "Without change, CIOs and IT consign themselves to tending a garden of legacy assets and responsibilities."

CONTENT ANALYTICS STARTUP SYNAPSIFY RAISES \$600K

► Synapsify specializes in analyzing text and assigning a value to it based on multiple factors, which makes its services of prime interest to any organization that depends upon written content to get its message out or seek favor for its brand. That is, of course, a huge potential audience, which goes a long way to explain why the Bethesda, Md.,-based company was able to raise \$600,000 in seed funding from Ingram Content Group's ICG Ventures.

Synapsify's solution employs "linguistic algorithms" to "read" written content, index it, compare it to existing content (including, for interested enterprises, competitors' content), and, as Synapsify puts it, "reveal the quality, balance, credibility, and quotability of such content and its most important topics and phrases." In addition to more readily apparent uses such as content management and search, Synapsify offers solutions tailored to brand analytics, CRM and consumer review comment analysis, and employee recruitment.

As Synapsify CEO and co-founder Stephen Candelmo puts it, "Our patented text analytics technology goes beyond simple keyword mentions or one-dimensional positive, negative or neutral classifications, bringing value to the market in a new and exciting way."

SYNAPSIFY



MOBILE MANAGEMENT COMPANY AIRWATCH RAISES \$200M

► Before the days of BYOD (bring your own device) policies and the related buzzwords "consumerization" and "personalization," deploying mobile devices across an organization was a relatively straightforward process. Today, however, that process has fractured, as many organizations must deal with employees using a variety of device types and platforms.

AirWatch, a rapidly growing company based in Atlanta, strives to become the go-to source for enterprise mobility management solutions. AirWatch focuses on providing end-to-end security across all devices, whether they're running Android, BlackBerry OS, iOS, Symbian, or Windows Phone. But AirWatch rounds out its full range of mobility offerings with management solutions for devices, applications, content, and email, among others.

Recognizing the value of the AirWatch platform and customer base, which the company says is growing at a rate of 500 clients per month, Insight Venture Partners led the way in a Series A funding round that will give the company a \$200 million equity infusion. According to its press release, AirWatch plans to use the money "to fund strategic acquisitions, accelerate global growth, and drive innovation and adoption of AirWatch's content collaboration solution, Secure Content Locker."



MICROSOFT ANNOUNCES YAMMER TRANSLATION

► In June 2012, Microsoft announced its plan to acquire the startup enterprise social network company Yammer for a much-discussed \$1.2 billion in cash and integrate the business into its Microsoft Office Division. Microsoft remained fairly quiet about the acquisition until February, when it provided an update on the company: in 2012, Yammer's full-year sales were nearly three times those of 2011, and the total number of paying customers increased 165% for the year.

Microsoft followed the positive update with an announcement that indicates how Yammer is evolving under the Microsoft umbrella: Microsoft is planning to incorporate translation capabilities into Yammer, which means that messages written in the sender's language will automatically be translated into the recipient's language. "Removing language as a barrier to cross-company collaboration can be a competitive game changer for multinational organizations," explained Adam Pisoni, Yammer's co-founder and now GM of engineering for the Microsoft Office Division. "It opens a world of possibilities."

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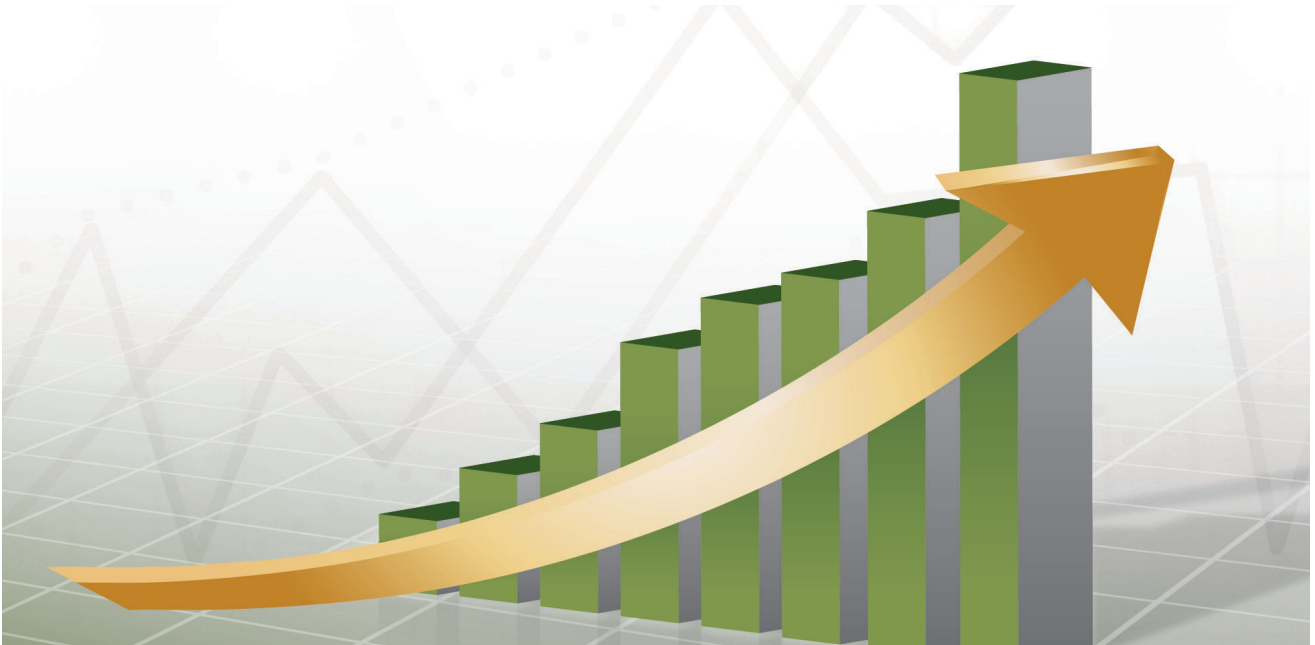
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ERP Hype vs. Value

Learn From Mistakes To Improve Your Implementation

ERP (enterprise resource planning) typically deals with an organization's financials, but it can be expanded—depending on the deployment—to cover multiple business facets. “Basically, it's the software that you run your business on,” says China Martens, an analyst with Forrester Research (www.forrester.com). “It's where you're doing your finance, managing your people, paying your people, and if you're in manufacturing or different industries, running those industry processes on the software as well. It's typically anything that's back-office and transaction focused.

The front office would be where your sales people would be using CRM, although ERP can include some CRM functionality as well.”

George Goodall, senior research analyst with Info-Tech Research Group (www.infotech.com), adds that “every industry will interpret what goes into an ERP system a little differently, but at the end of the day, ERP is a tool to manage your core operations within the enterprise.” But what constitutes a core operation is entirely up to you and your industry. For instance, “the needs of a municipal government are going to be very different from the needs of a

healthcare provider or manufacturing organization,” Goodall says. In other words, ERP can be whatever you need it to be.

And that's where a lot of the problems with the technology have surfaced. You have the option of purchasing “an ERP suite from one particular vendor that would have all of these different modules together, and ideally they're all integrated with each other,” says Martens. Or, “you could go best of breed and buy your finance from one organization and HR from another,” she adds. This not only leads to potential integration issues, but brings in

Key Points

ERP systems are designed to help you better manage data across your entire organization, but the technology has somewhat of a sordid past and many stigmas attached to it.

ERP is a fit for every organization, and there's a good chance that you already have some form of it in place, whether it's a spreadsheet or a full-fledged implementation.

Larger organizations can use ERP to better manage the data from acquired companies as well as to help expand their business into other countries.

The face of ERP will change as companies opt for flexibility and better integration while avoiding the overly complex implementations that have burned them in the past.

even more complexity to a system that started off so simple in the beginning.

COMMON ISSUES & A BAD REPUTATION

Goodall remembers when ERP started off as a “basic accounting package” that was much easier to use than some current iterations and was considered a no-brainer for most companies, because it was essential to doing business. “There was one person, the package was installed on a computer that sat on a desk, and if you had a problem, you went to talk to that one person,” says Goodall. “It was Mary in financials or accounting. And now we’re talking about data in a lot of different places, potentially different jurisdictions across different systems, and it’s incredibly complicated.” Add to this the fact that some companies say “we had ERP done to us” and the “product basically took over,” according to Goodall, and that’s a recipe for disaster.

Martens says that even the term ERP has had “so many bad connotations, because you think about all of these failed projects and lawsuits.” Manufacturers started off with a form of ERP that helped with business processes, but then as those companies expanded, so too did their ERP solutions. And as ERP moved out of manufacturing and into other industries, companies started adding even more functions to their implementations until they created a system that was way too specialized

and so heavily customized that they couldn’t “upgrade and were kind of stuck with it,” says Martens.

For Martens, it makes much more sense for companies to remember how ERP systems used to be and move back to a “more flexible system” that focuses on doing a few things right, rather than trying to do everything with mixed results. “Where it’s been successful is where you’ve been very strong about the scope that you’re going to [have],” she says. And when companies, regardless of size or industry, make the decision to not necessarily “bring in any more functionality,” but instead swap out their existing processes for better ones, they are much more likely to succeed, Martens says.

A FIT FOR MOST (IF NOT ALL) COMPANIES

Whether you are aware of it or not, your company already has an ERP system of some kind in place. Every company has to keep track of financials in some way, which could be accomplished with “basic accounting packages” or even with spreadsheets, according to Goodall. But there does come a point when companies outgrow these simpler solutions, at

roughly 150 employees, or need something that can “consolidate information from multiple sites and geographies,” he says. In these situations, it’s critical to implement a more advanced ERP system that’s capable of tracking this information and allowing you to analyze it when needed.

The biggest issue that comes into play during the ERP implementation process is understanding what your

business needs are depending on company size. “It’s a bit like Goldilocks for a lot of companies,” says Martens. “For some companies, what they have is too small, where they’re using a lot of Excel spreadsheets, but as the business gets bigger it becomes much harder to use those systems. For companies that sit in the middle, often they might have something that’s too big,

sophisticated, and costly for them, and they’re paying a lot in maintenance.”

The key for any company is to “find what’s just right for the organization,” which Martens says “might be a prevailing reason to change.” If your existing ERP system isn’t flexible enough for your company, then you have a golden opportunity to start over and find something that will fit your needs now and in the future. For instance, larger companies may need a solution that supports multiple languages and currencies, whereas a smaller organization with little or no international business can focus on one country and one language. Matching the correct features to your business is a great way to save money and improve the long-term viability of your ERP system.

With a solid ERP system in place, you can not only know how many people work for you, but have all of their important information at your fingertips.

ERP AMONG TOP CIO PRIORITIES FOR 2013

► In Q4 2012, Gartner (www.gartner.com) surveyed more than 2,000 CIOs to identify their top business and technology priorities for 2013. “Digital technologies provide a platform to achieve results, but only if CIOs adopt new roles and behaviors to find digital value,” says Mark McDonald, group vice president and Gartner fellow. With that in mind, there was good news in the survey for ERP providers, as ERP applications made the list of top technology priorities for this year. Here is the complete list, ranked in order.

- | | |
|-------------------------------------|---------------------|
| 1 Analytics & Business Intelligence | 6 IT Management |
| 2 Mobile Technologies | 7 CRM |
| 3 Cloud Computing | 8 Virtualization |
| 4 Collaboration Technologies | 9 Security |
| 5 Legacy Modernization | 10 ERP Applications |

BENEFITS FOR LARGER ORGANIZATIONS

Aside from the long-standing financial management and planning features that ERP systems provide, there

are also specific benefits that larger organizations can take advantage of. For instance, business acquisitions can cause issues with ERP because “you have a hodgepodge of all different systems, they don’t talk to each other, and it’s very painful,” says Martens. You not only have to deal with the data from your own company, but streams of information from a variety of other sources.

But where multiple ERP systems cause a problem, a single centralized ERP system can actually make life easier. Imagine being able to open up a piece of software and see the financial or HR information for every remote office or separate entity under your enterprise’s control. Martens says that companies should be able to answer basic questions like “How many people do you employ?” and that you should be able to answer that quickly with whatever system you have in place. With a solid ERP system in place, you can not only know how many people work for you, but have all of their important information at your fingertips.

Another common issue that can arise with ERP is when a company goes international. “[Companies] say, ‘I want to expand into Brazil, China, or India,’” says Goodall. “‘How do I support my financial operations in those far-flung geographies?’ The answer is to work with an ERP vendor to establish a system that can work with your infrastructure to “consolidate other companies and support expansion into new geographies,” he says. As we mentioned before, ERP systems can actually support multiple languages and currencies



“In some cases, you have to start all over again. But as you do start over, you have to be very clear that you don’t start getting back into all the bad habits that you had in the past. Often, why [companies have] had to customize is because the systems they’ve been using have been so limited and they’ve hit a dead end when they’re been trying to tailor them. The hope with today’s ERP systems, and going forward, is that they are a lot more flexible and you can do a lot more with them.”

China Martens

analyst, Forrester Research

in order to make international data gathering easier, so if you establish a global-friendly ERP system before expansion, you can avoid many of the headaches associated with such a move.

WHO BENEFITS MOST WITHIN THE COMPANY?

If you follow the traditional ERP model, then employees in the financial department of your company stand to benefit most from an ERP system. But if you implement it correctly, ERP can benefit almost anyone. It’s important to stress correctly, because, says Goodall, “we’re getting to the point where ERP vendors want to sell you everything.” He says that many vendors claim their solutions support HR, sales and marketing, and even content management functionality, where companies have to contend with the process of capturing

data from paper-based sources such as invoices.

You must ask yourself whether or not a specific business process should be included in your ERP system, instead of throwing it in simply because you can. You might even be able to look at your specific industry and determine what types of information should fall under your ERP banner. For instance, a healthcare facility might need financials, patient care, procurement, and that’s it, according to Goodall. But the possibilities don’t end there. You have to look at each individual department within your company and it won’t be hard to see where ERP could be beneficial.

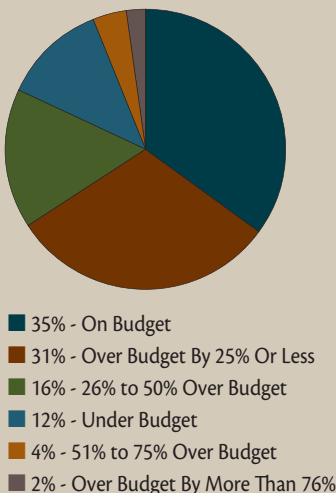
“As companies are trying to reimagine what they want to do with this software, they’re really trying to make it more usable and open up how many people can access the data in there,” says Martens. “As you can imagine, if you’re using this software to run your business, there’s all kinds of rich data in there that people elsewhere within the organization would want access to. People in the sales side would want to know what’s happening in finance, and [HR would] want to know why are we losing so many people and why are we hiring so many people.”

For Martens, it makes much more sense for companies to remember how ERP systems used to be and move back to a “more flexible system” that focuses on doing a few things right, rather than trying to do everything with mixed results.

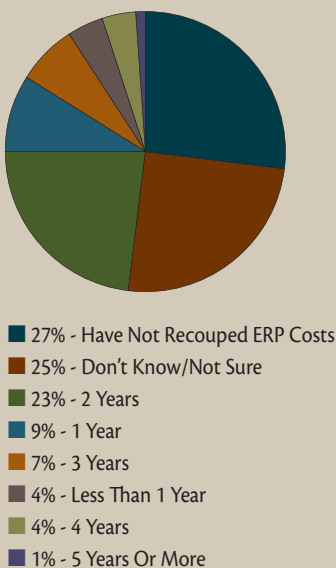
ERP COSTS EXAMINED

► Between September 2012 and January 2013, Panorama Consulting Solutions (www.panorama-consulting.com) conducted a survey of 172 ERP users. The results, compiled in the firm's "2013 ERP Report," illustrated the range of positives and negatives associated with ERP implementations. For example, 53% of ERP projects went over budget, but the time to recoup costs improved by 7 months relative to the consulting firm's 2009 ERP survey.

ERP IMPLEMENTATION COSTS



ERP TIME TO RECOUP COSTS



"I think the term will maintain itself, but the one thing that everybody agrees on is that ERP equals financials plus something else, so I think we're seeing increasingly that ERP really refers to financials and everything outside of that is up for debate. There's just a lot of data out there now that needs to be maintained. What do we keep in the system and what do we keep out of the system?"

George Goodall

senior research analyst, Info-Tech Research Group

THE FUTURE OF ERP

According to Martens, the death of ERP has been declared "on many occasions," but it will always be around in some capacity because "it's what you run your business on." She says that companies should be more proactive with ERP and take ownership over it. But she does understand that some companies are already in deep and have implemented "all singing, all dancing ERP suites" that they don't actually need. In fact, a lot of companies are so frustrated with ERP systems that they are ready to give up.

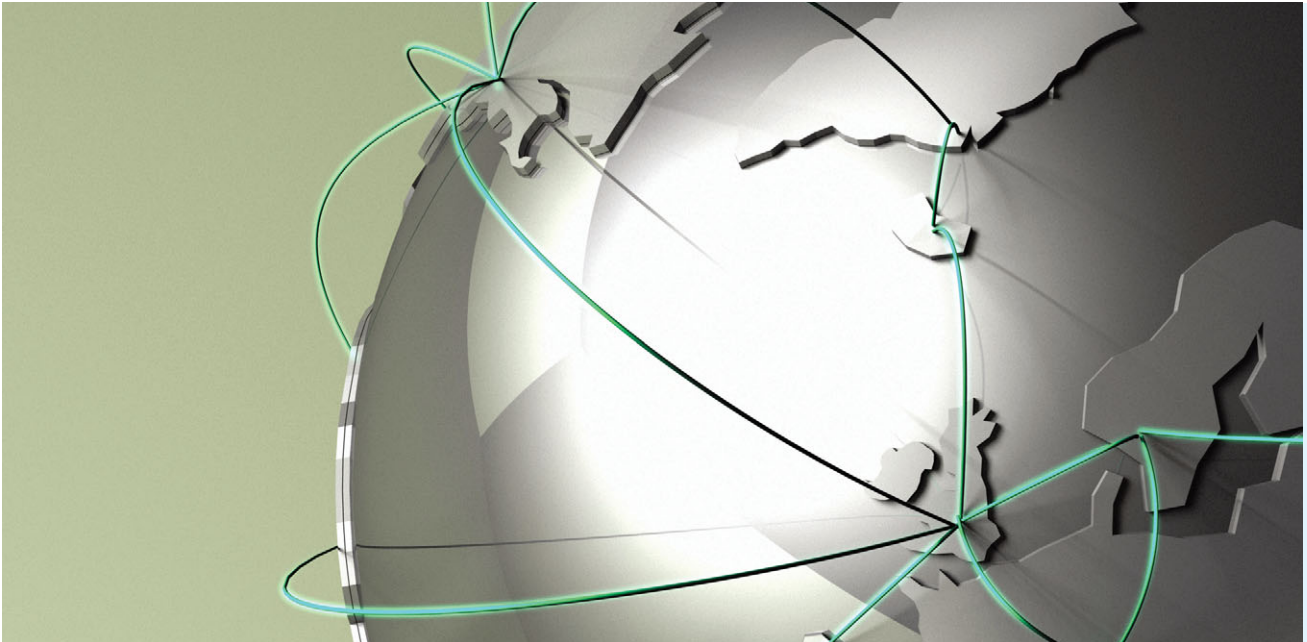
However, both Martens and Goodall have some good news for companies that want to take advantage of ERP but avoid reliving nightmares of the past. "Maybe the ERP of the future is going to be a lot more modular so there will be a limited set of standard functionality, particularly around general ledger, finance, and maybe some elements of human capital management," says Martens, "but then there will be a whole variety of plug-in components that you can get from the ERP vendors or maybe from other vendors that are maybe specialists in that area."

Martens also believes ERP implementations will take a hybrid approach where "you pick and choose the best elements of what's within a suite, and then you bring in the best of breed that

you might need for the particular industry you're in, the particular region you're in, or one particular area of ERP that an overall suite isn't that strong in." With this approach, you can take advantage of every aspect of ERP that fits your business without the need for customization, so you can still utilize best practices and receive updates.

For Goodall, it all comes down to IT maturity. In order for a company to implement a certain type of ERP system, it needs to have employees in place who fully understand and utilize it as efficiently and effectively as possible. "It's not about the technology; it's about our ability to live with the technology," says Goodall. He adds that there are cloud-delivered ERP solutions available in the market, but that companies should be careful to avoid integration issues if they spread their data out to multiple locations.

The future of ERP is not crystal clear, but one thing that Martens and Goodall aren't afraid to say is that it's here to stay. They both suggest that maybe the ERP moniker itself is to blame, because it has such a stigma attached to it. But if you can look beyond the traditional at newer, more complex use cases and build a solution tailored to your company's needs, it's more than possible to take advantage of ERP and make your business process much more efficient. ●



IT Outsourcing

What Providers Can Offer Companies Now & Tomorrow

TURN YOUR ATTENTION to the topic of IT outsourcing and it doesn't take long to detect that in the eyes of some it has become an antiquated business strategy. Conversely, plenty of others believe IT outsourcing is as viable an option as ever. What seems universally agreeable is that IT outsourcing has gone through noteworthy transformations over the years and will continue to do so moving ahead. The following looks at these changes, where outsourcing currently sits, and what it can offer.

Arguably, the most cited knock against outsourcing is that it takes

white collar jobs away from American workers—a point that routinely surfaces during election cycles. “Any time we get closer to a presidential election or midterm elections and they start talking about this idea that outsourcing is evil and takes away American jobs,” says John Madden, Ovum (www.ovum.com) principal analyst, IT services, “the debate over outsourcing heats up accordingly.”

Madden says there's a reason outsourcing has been around so long, namely because it has largely helped grow America's prominence globally. “I think people realize we're in

a global economy. We have a lot of U.S.-based companies leading the way in different industries, and they have to have a presence and need operations in certain countries, not just from operational standpoint but also a go-to-market standpoint,” he says. Those knowledgeable of the outsourcing, he says, “realize the benefits it can deliver, know outsourcing isn't the bogeymen, and know outsourcing isn't inherently a bad thing.”

Another belief some hold about outsourcing is that it's an outdated approach that has experienced ups and downs in recent years in terms of

Key Points

Many experts consider IT outsourcing to be in the midst of a change due to numerous factors, including because companies expect additional benefits beyond saving costs.

Although cost-savings remain a primary driver for companies to enter outsourcing, other factors are playing a role, including a desire for outsourcers to help companies grow their businesses.

Areas that some experts believe the IT outsourcing industry must adapt to with their services included cloud computing, mobility, data, analytics, and social media.

Legal issues to consider regarding outsourcing include quality expectations, pricing, change-management procedures, SLAs, intellectual property, and importing and exporting data.

acceptability, affordability, and usefulness. Bryan Britz, a research director with Gartner (www.gartner.com), says many of the industry's recent challenges are due to bad decisions by clients and providers. "During the 2008 and 2009 lifeboat scenarios, many clients and providers were renegotiating deals with the explicit shared goal of finding costs to toss over the side of the boat until we got through the stormy waters," he says. "This created some service delivery issues and definitely left an innovation hole that hasn't been filled."

Todd Hintze, a managing partner with Everest Group (www.everestgrp.com), says, however, that when IT outsourcing is properly designed and managed, organizations realize the value it was originally intended to provide. "Many of the exceptions in the industry often reflect a failure to properly design the solution, align interests, and govern for changing needs of both parties," he says. "However, this doesn't mean we don't see organizations change the original solution. In fact, we should expect to see companies correct and/or adjust their solutions—change scope, repatriate select services, introduce new service providers, etc. This said, we aren't seeing a wholesale reversal of IT outsourcing."

OUTSOURCING TODAY

A dominant theme among many who track the outsourcing industry is that it's in the midst of change. Roughly a decade ago, Madden says, "outsourcing was all about your mess for less" with outsourcing providers saying, "Give us your data center, pay us this much for this long, and we'll take on your employees and run the show based on certain SLAs and support agreements." Some contracts, however, left customers beholden to one vendor, and SLAs and support weren't always up to snuff, Madden says. "It was very much an IT- and cost-based transaction."

Today, cost remains a major factor driving companies toward IT outsourcing. However, outsourcing is a much more collaborative effort, says Madden, involving IT, CIOs, other C-level execs, and even CEOs, "because they want to look at [outsourcing] from a business and IT value angle." Beyond cost savings and ROI, companies want to know what outsourcers can do to help a business grow, provide a global presence, add a mobility platform, and meet other business requirements. "It's not just the notion that 'We'll leave IT to the IT shop because they know what they're doing,'" Madden adds; C-level execs must get involved in IT decisions to ensure those decisions will truly grow the business.

Britz says the industry is currently reinventing its value proposition. "The labor arbitrage window is closing, clients are adopting public cloud services, and clients appear more willing to change providers in the past couple of years than ever before," he says. "You can look at a mature segment like desktop outsourcing and [note Gartner's] research finding that 38% of organizations plan to be BYOD only by 2016, and it becomes evident that the services being provided will change dramatically." The same is true of the impact that clients moving workloads from dedicated infrastructure to the cloud is having, he says. "The ITO industry is squarely at the apex of most disruptive forces in the market."

Although outsourcing business models from the 1990s and early 2000s don't produce enough profit for providers today or deliver enough value to clients, Britz says, he doesn't agree that outsourcing is outdated strategy. "I do agree that ITO providers' delivery models must continue to evolve or that provider will find itself outdated," he says. As an example, Britz cites public cloud IaaS (infrastructure as a service), a segment included within Gartner's ITO forecast, as Gartner considers

IaaS to be the externalization of infrastructure services. "The question for an ITO provider becomes, 'How does it help its clients operate agilely within a hybrid IT environment that includes various cloud and dedicated deployments?' I see a lot of provider investments related to that challenge," he says.

Info-Tech Research Group (www.infotech.com) does distinguish outsourcing from cloud services, which are growing, according to Andy Woyzbun, analyst with Info-Tech. Woyzbun characterizes the outsourcing industry as stable, saying there "have been no major shifts recently in either the degree of use of outsourcing we see, the nature of outsourcing services consumed, or the perceived quality of services." He also disagrees outsourcing is related to outdated strategy. "As long as significant labor cost differentials exist, there will be an economic benefit in outsourcing (especially off-shoring) certain labor-intensive activities," he says. Further, Woyzbun expects outsourcing to continue delivering faster results vs. hiring or retraining permanent staff. "Outsourcing organizations continue to improve the consistency of their services, as demonstrated by their certifications," he says, although "outsourced data center operations [are] challenged by cloud providers."

Madden sees cloud services "as something as more complementing to traditional outsourcing than conflicting or supplanting outsourcing." He adds that outlook on the cloud-outsourcing relationship varies by region. "Here in the U.S., there's a lot of embedded infrastructure, but in Asia-Pac, you talk to some customers and they just want their entire IT environment to be all cloud. And it could be something an outsourcer provides," he says.

Succinctly, Hintze says successful providers today "deliver value that buyers have elected not to focus on as their core businesses. They do so

through scale, focused investments in people and delivery platforms, and access to affordable talent.”

WHAT TO EXPECT

A decade ago, Hintze says, many firms and industries were still embarking on their first or second outsourcing transaction. “Even though many processes had matured as outsourced services, it was still new to some organizations.” Today, it’s difficult to find an established organization not managing a significant outsourcing arrangement, he says, as many organizations are becoming sophisticated buyers/users across many IT providers. “Specifically, IT outsourcing has been on the forefront of mainstream outsourcing initiatives and is viewed as the most mature.”

At one time, Madden says, IT outsourcing meant long-term, complex megadeals with outsourcers taking on all parts of an IT department for a company. In the mid-2000s, the focus shifted more toward handing out silos to different outsourcers to obtain better cost and scale, and also IT outsourcing expanded beyond infrastructure management to include managing applications, he says.

“When the India vendors got involved after 2000, it was all about low-cost offshore application development and application management,” Madden says. “Now we’re at a point that there’s still a lot of outsourcing going on, but the outsourcing is a lot more focused.” Companies are looking to consolidate outsourcing suppliers running their infrastructure, applications, and business processes, he says. Furthermore, companies are grappling with such newer trends as cloud computing, mobility, data and analytics, and social media.



Any contract between a company and an outsourcing provider “must be clear on scope of work, quality targets, pricing, termination conditions, and especially change-management procedures.”

Andy Woyzbun

analyst, Info-Tech Research Group



“Specifically, IT outsourcing has been on the forefront of mainstream outsourcing initiatives and is viewed as the most mature.”

Todd Hintze

managing partner, Everest Group

Some companies that are trying to integrate technologies into their environments are doing it themselves but “they’re also looking to their outsourcer to help,” he says.

Woyzbun says there is “less confusion and lack of confidence” in outsourcing’s viability among most companies today. The percentage of IT budgets allocated to outsourced staff (domestically at 8% and offshore at 4%) hasn’t changed materially from 2009 to 2012, he says, and isn’t projected to change much this year, either. “Outsourcing has become more efficient over the years. Although labor rate differentials have narrowed somewhat, buyers have become smarter about specifying work, and outsourcers have improved their internal processes,” he says.

In general, Britz says outsourcers can offer as much or as little as a client wants. “There is still a lot of staff augmentation that gets described as being outsourcing, even

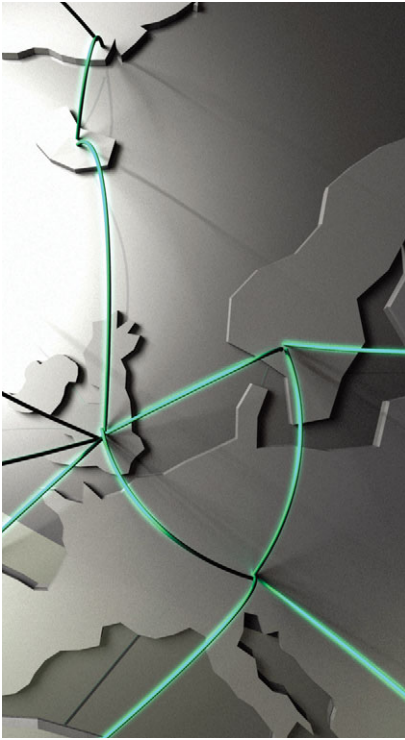
though all the responsibilities for outcomes still sits with the client,” he says. Tangible business outcomes linked to savvy infrastructure management strategies are what companies should expect from providers, he says. “ITO providers will be required to possess the analytical prowess to fuel this vision,” he says. “Agility, cost optimization, security, and proactive continuous improvement are areas where ITO providers need to help their clients.” Clients should require providers to assist in improving how “they articulate business outcome implications of infrastructure sourcing decisions.”

GOOD CANDIDATES

Plain and simple, many companies enter into IT outsourcing to cut costs. Outsourcing an existing service as opposed to a new one is less likely to reduce costs, however, according to Woyzbun. Today, most companies use IT outsourcers

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"The labor arbitrage window is closing, clients are adopting public cloud services, and clients appear more willing to change providers in the past couple of years than ever before."

Bryan Britz

research director, Gartner



"Here in the U.S. there's a lot of embedded infrastructure, but in Asia-Pac, you talk to some customers and they just want their entire IT environment to be all cloud. And it could be something an outsourcer provides."

John Madden

principal analyst, Ovum

primarily to acquire application development and maintenance, call center, and comprehensive data center services, he says. Some companies also desire acquiring proven service expertise that the company lacks internally or would need to build, he says.

Britz says too many companies identify a cost-savings initiative and make it the sole driver for outsourcing, which is great the first several years, "but then what? . . . You've signed up for a long-term relationship and made the internal business case for doing so. That's hard to undo," Britz says. "There's this myth in ITO that we eventually reach a steady state that we can effectively manage. That sounds great for IT but is completely impossible to achieve."

Whether due to mergers and acquisitions, geographic expansion, a need to enhance speed-to-market, or the adoption of new technologies outside the direct control of IT, Britz says, businesses are in constant flux. Often, companies that simply offload a near-term problem to an

outsourcer are the "least happy with that decision to outsource two years after completing the transition," he says. "If you're entirely a reactive organization, outsourcing is likely to cause some challenges after you've received the initial benefits in the contract." That said, the best strategy for some companies in mature industries is "to keep squeezing out cost," Britz says.

Where outsourcing makes sense less often, Woyzbun says, is when used as a replacement for services already adequately provided in-house. "Improved economics and quality may be elusive after taking into account the financial costs and loss of knowledge resulting from terminating existing staff," he says. "Stable specifications are a necessary condition for successful outsourcing. Organizations chronically challenged with scope creep or change requests risk disappointment."

THE LEGAL ISSUES

Any contract with an outsourcing provider, Woyzbun suggests, "must

be clear on scope of work, quality targets, pricing, termination conditions, and especially change-management procedures." Overall, the list of legal issues companies must address when outsourcing can be exhaustive, Madden says, covering importing and exporting data, security, intellectual property, and SLAs and support capabilities among other facets.

Another noteworthy issue when the cloud is involved is in-boarding (bringing a customer aboard) and off-boarding (exiting an agreement), Madden says. "There needs to be very specific terms drawn out that stipulate who owns what, how will you reclaim data, transfer it—being very specific is very important." Most problems that occur with outsourcing contracts relate to miscommunication on both sides concerning expectations, including those relating to resources (people and capital assets), legal specifics, and project management, Madden says. "Generally speaking, when outsourcing goes bad it's because there's failure in one of those areas." ●



Green That Makes Sense

Not All Initiatives Are Created Equal

GREEN IT IS ONE TERM that covers an array of technologies and initiatives. In recent years, a growing number of vendors worldwide have touted the green aspects of their products, typically in the form of technologies and features that simultaneously lessen environmental impact, improve efficiency, and lower costs. But the truth is that not all green solutions are created equal, nor will they fundamentally improve your business.

For that reason, it's important to sort through all of your options to find the ones that fit your business. We'll explore some green IT initiatives that

will almost certainly make an impact on your business, as well as others that may not be as helpful as they claim to be.

Green Initiatives That Deserve Your Attention

CUT BACK ON PRINTERS & PRINTING

Many analysts agree that printer usage reduction is one of the most significant resource/cost-consuming activities in companies today, but it also happens to be an issue that gets

the least amount of attention. "Very few companies have internal print reduction goals and programs to reduce paper [consumption]," says Craig Le Clair, vice president and principal analyst at Forrester Research (www.forrester.com). He adds that a lot of companies also aren't taking full advantage of electronic communication, such as email or other messaging alternatives, and instead are still primarily using paper for invoices and other customer correspondence.

Le Clair says the main reason paper reduction isn't a major sustainability focus is because companies and

Key Points

Printer reduction cuts down on the amount of paper your company uses, lowers your printer footprint, and minimizes power consumption.

It's important to focus on building efficiency, but you have to start with some of the more extensive projects before moving to smaller ones to get the best possible results.

Green IT is used quite often as a marketing term, so it's important to make sure solutions are actually as environmentally friendly as they claim to be.

Be careful when using rankings or rating systems when determining success. Instead, use your own measurements to show the effectiveness of your green initiatives.

employees have been stuck in the same routines for many years and making a change would require many behavioral adjustments. He recommends that companies take advantage of mobile technologies, which don't require the use of paper. For instance, if your company created a mobile app that let a customer view his billing and account information or check a statement, then you wouldn't have to send out a monthly paper version in the mail. Le Clair also says companies need to manage their demand and create sustainability goals. For instance, an organization could change its target from 30 million prints per month to 26 million and use that goal to figure out ways to consolidate its printers.

As part of the print reduction effort, Le Clair adds, companies need to change the device-to-user ratio from the traditional one printer for every three employees to something more efficient, such as one printer for every 10 employees.

Frank Trovato, consulting analyst at Info-Tech Research Group (www.infotech.com), agrees reducing the number of printers is necessary for companies that want to become more environmentally friendly. "Get those desktop printers out of the building," Trovato says. "No one should have a printer on their desktop. There might be some exceptions, like HR might need a printer in their room for confidentiality reasons, but generally speaking most people don't need that." He also recommends employees opt for double-sided printing and reducing how often they print. Employees could also circulate reports electronically rather than printing out hard copies.

VIRTUALIZE & CONSOLIDATE

Virtualization is a popular approach in data centers today because it improves efficiency, reduces costs, and can aid in server consolidation as well with overall data center consolidation. These same benefits also



"The use of paper in [the customer communications] process is really inefficient and very polluting because of all the costs of the industry of transporting and managing it. But it's hard to change people's behavior, and you have generations of workers that have always worked with paper. Companies have not provided aggressive or effective electronic consent or adoption programs. They do not incentivize the customer enough and/or provide a horrible customer experience."

Craig Le Clair

vice president and principal analyst, Forrester Research



"The companies that have the best success with green IT are the ones that are able to incorporate environmental best practices in their corporate strategy and culture, keeping in mind that there has to be a business case behind it, too."

Frank Trovato

consulting analyst, Info-Tech Research Group

help make virtualization a sustainable technology that can make businesses greener.

"It's really about power consumption and cooling," says Le Clair. "What virtualization means is that instead of having a server bank dedicated to an application, you can manage this portfolio of applications out of the cloud and, based on utilization, move applications to whatever server is not fully utilized. It reduces your footprint of servers."

Trovato also thinks that companies need to accelerate the server virtualization and consolidation processes because "the fewer servers you have running, the less energy consumption." And virtualization can make it so that one new server takes

the place of two or more existing servers, which maximizes consolidation efforts.

USE METRICS & MEASUREMENTS

Le Clair says it is important to align metrics to environmental initiatives for management purposes; however, you may find it difficult determining how to use these metrics effectively. Citing an example, Le Clair says you can tie metrics to your strategic objectives at the operational level and establish a link between the two. Make a specific goal for reducing your carbon footprint or paper distribution, for instance, by using metrics to determine whether you're hitting those targets.

When addressing power efficiency, Trovato says it's key to measure existing energy use, "because some companies will get on this green IT initiative and start implementing some things, but they don't take a baseline measurement." Then, about a year down the road, some of those companies "have no way of knowing if they've actually lowered their energy costs." Trovato warns that if you don't use measurement and metrics, you may find yourself struggling when trying to implement more advanced green initiatives, because you won't "have the numbers to make a business case." And if you need help with metrics, he says, there are plenty of vendors that can help you throughout the process.

Stephen Stokes, vice president and distinguished analyst at Gartner (www.gartner.com), says metrics not only identify where you are and how far you've come, but they also help you focus on what you can do now and in the future to improve efficiency. Stokes suggests putting systems in place around the organization to track energy usage as well as a range of human and IT resources. "Once you've done that, you can actually invert the 80/20 rule. Instead of spending 80% of the time trying to collect data and 20% of the time thinking about it, you can spend 20% or less of the time grabbing the data, and 80% of the time trying to think creatively about what it means and how it can be used to innovate inside of the organization."

SUPPORT A MOBILE WORKFORCE

The office environment has been a staple of business for a long time, but with advances in technology, it's possible for more employees to work from home, which can mean less time spent commuting, a potentially smaller footprint for your data center, and a greener business outlook. You can set up a VPN (virtual private network) for secure access to

internal resources, use VoIP solutions to stay connected, and much more. Plus, there are other systems in place to ensure administrators maintain the ability to manage employees.

"There are many companies that are progressive in terms of mobile workers and virtual workers, but a lot of companies aren't," says Le Clair. "They force you to commute to an office, which isn't very sustainable. They have to have a second place as opposed to your home office to work. A lot of that relates to the inability to use technology to manage the workers' outputs in a more efficient way. With things like process management workflow software, you can get the same kind of control over the worker and all of the status updates if you put in a monitored process layer."

IMPROVE BUILDING EFFICIENCY

Many companies understand the need to improve their overall building efficiency, but they may not know where to start. That's why Stokes likes to provide companies with layers of efficiency they can move through as they try to make their businesses more efficient and sustainable. Although most companies start at the bottom layer with individual devices, which could be considered low-hanging fruit, Stokes recommends starting with the top layer, instead, with even larger scale projects.

The top layer has to do with space utilization. "Whether your building is efficient or not," Stokes says, "if you're not using it appropriately, that's a big mistake." He explains that there are many good scheduling and utilization tools available that let you focus on specific actions such as heating or cooling only the conference rooms slated for meetings on a specific day instead of all 15 rooms. A similar program available for lighting systems uses smart LEDs that feature built-in sensors and timers so the lights turn off automatically after

someone leaves a room. It's all about taking office space into account and not wasting resources.

The middle layer deals with making your business processes more efficient by using less resources or consolidating certain facets of your company. Stokes uses the example of turning an entire bank into "a teller machine or mobile app," that obviously uses fewer resources than a full-scale facility. And after you make your business processes more efficient, you start to look at your HVAC systems, water waste, and more. These are all major facets of the data center that need to be running at peak efficiency in order to help the company as whole.

The bottom layer addresses individual devices. Companies need to consider whether to allow BYOD; move to the cloud; or extend the life usage of each IT asset, which isn't popular with employees, Stokes says. Or you may need to consider a range of other potential changes you can make to your sustainability approach, including "dematerialization, reduced printer, and improved recycling, remanufacturing, and reuse," he says.

If you can start with larger ideas and move down to simpler ones, then you can make sure your company is efficient and sustainable from top to bottom.

Green Initiatives That Miss The Mark

MOVING DATA CENTERS TO COLDER CLIMATES

Many companies have considered relocating their data centers or other facilities to colder climates to take advantage of free air cooling. Trovato says that this is a great thought; however, depending on where you want to move, you may have trouble staffing your data center and you may encounter other location-based issues, such as poor weather.



“The way to make sure that you are delivering good outcomes when you [implement sustainability programs] is to basically make sure that your company and your IT department does detailed and rigorous cost to serve analytics. Because if they measure the cost to serve on a regular basis, they’ll be able to directly quantify the extent to which the projects are benefiting the business, what their ROI is, and what the long-term gain is in terms of reducing the cost to serve and improving gross or net margins.”

Stephen Stokes

vice president and distinguished analyst, Gartner



“You don’t necessarily need to be up in the arctic to benefit from cool air,” says Trovato. “There was a study done that said as long as the annual temperatures average [less than] 72 degrees Fahrenheit, you can still leverage seasonal or overnight free cooling. Using these technologies that draw in cool air from the outside, you basically connect your venting system to the outside air. You can still do that even if you’re in New York or the middle and northern U.S. You’re going to have overnight temperatures that will be cool enough, and seasonal temperatures that will be cool enough.”

USING THE CLOUD & DATA CENTER LOCATION

Although it’s true that the cloud is a beneficial technology for scaling your storage needs and dealing with overflow storage, Stokes says companies may be making the move to the cloud in haste because they aren’t as efficient internally as they should be. “It’s often quoted that the data center utilization rate sits around 12% or 15%, so you’re only using about 1/8 of your total capacity,” Stokes explains. He adds that the main reason companies move to the cloud is to avoid overprovisioning,

but that “any cloud provider will, by definition, have to have similar overprovisioning to ensure they aren’t going to run out of supply to support demand.” For that reason, the cloud may not be as environmentally friendly as originally thought.

There is also the issue of where cloud provider data centers are located. Stokes points out that if these facilities are in China, Poland, Australia, most of America, or in some other locations, “it’s highly likely that they will be fueled by electrons that have been generated by coal-fired stations.” You may be able to consolidate your data center, but by using a cloud service with an inefficient data center, you might be making the problem worse. If possible, use a provider with its facility located in New Zealand, Iceland, Norway, Brazil, or other companies that have grids in place that use hydropower, geothermal power, and other more sustainable sources.

USING RANKING SYSTEMS AS A GREEN BAROMETER

Companies need to reconsider using ranking systems or ratings as a way to gauge sustainable success. Stokes says he doesn’t like that rankings are

essentially “qualitative estimates of green performance,” rather than concrete results. He also disagrees with how most ranking systems are “held by parties with vested interest” and tend to “criticize bad performance rather than praise good performance.” Stokes adds, “Far too many of these entities offer up a ranking and then a week later they make a phone call and say, ‘Hey, would you like us to help and offer you consulting services to improve your ranking?’ That seems like a terrible conflict of interest to me.”

Stokes says that this way of thinking may be going by the wayside soon because many companies view the use of ranking systems “as the inaccurate exercise of compliance reacting to the market.” And he says that leaders are “being proactive and seeing what they can do in terms of exploiting new levels of information, new vessels of social media, mobility, predictive analysis, and big data to really improve the situation.” After all, the only true way to know whether your green initiatives are having the desired effect is to track your progress, manage your results, and compare them to your long-term sustainability goals. ●



Hybrid Cloud Computing

Combine Platforms For Improved Flexibility & Scalability

VIRTUALIZATION AND CLOUD computing are two of the most popular and exciting new technologies to emerge in the last few years. Companies are turning to these approaches to help cut down on

their internal resources, help applications and software run much more efficiently, and perhaps, most importantly, help them save money. With this large migration toward cloud computing, many companies

are trying to find additional ways to expand their capacity without blowing out their budgets, and that is where hybrid cloud computing comes into play.

Hybrid cloud computing gives companies control over multiple cloud instances with the power to move data and applications back and forth almost instantaneously. But a lot more goes into hybrid cloud computing than simply setting up two clouds and going to work. We'll give you a better understanding of how it works, point out some of the key features

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With this large migration toward cloud computing, many companies are trying to find additional ways to expand their capacity without blowing out their budgets, and that's where hybrid cloud computing comes into play.

Key Points.....

A hybrid cloud service is one that comprises a combination of private, public, and/or community cloud services from multiple providers.

For the solution to be truly hybrid, you must be able to share or push information from one cloud to another.

One chief benefit of joining an existing private cloud with an external cloud is that companies gain scalability without infrastructure overhaul.

When considering hybrid cloud computing, vendor lock-in can be a negative and should therefore be weighed carefully.

Hybrid cloud computing gives companies control over multiple cloud instances with the power to move data and applications back and forth almost instantaneously.

and benefits, and help you decide whether hybrid cloud computing is a fit for your company.

WHAT IS HYBRID CLOUD COMPUTING?

Most companies are aware of public and private clouds. These are large-scale platforms built to hold data from multiple sources and in some cases share that data. Public clouds are openly available, and there are quite a few vendors that provide these services. Private clouds are designed specifically for use within a company and are not available to outside users unless access rights are granted to do so. Hybrid cloud computing is simply a combination of two or more cloud platforms that can be used together for different purposes.

"A hybrid cloud service is a service that is composed of some combination of private, public and/or community cloud services from multiple providers," says Thomas Bittman, vice president and distinguished analyst at Gartner (www.gartner.com). "The purpose of combining services like this would be for capacity (using another provider's service for additional capacity) or capability (customized value-add services in front of a public cloud service)."

The most important thing to understand is that having access to two different cloud platforms, regardless of whether they are public or private platforms, does not immediately give you a hybrid solution. For many companies, hybrid

cloud computing combines the internal resources of a private cloud platform with the scaling capabilities of a third-party solution. In order for the solution to be truly hybrid, you must be able to share or push information from one cloud to another.

HOW DOES IT WORK?

Let's say you already have a private cloud established for internal use, but you foresee a time when you might outgrow your current capacity and want the ability to scale out if necessary. Depending on the infrastructure of your cloud platform and whether or not it's compatible with third-party solutions, you can work with a vendor to establish an external cloud for additional capacity.

From there, you should automatically be able to add capacity as you need it to the external cloud and push data that doesn't necessarily need to be stored on internal servers to the secondary cloud. In some cases, you can even buy and sell excess capacity through a clearinghouse.

According to John Sloan, a lead research analyst for Info-Tech Research Group (www.infotech.com), hybrid cloud computing consists of "an internal cloud" and an "external resource" that are "federated together." Rather than being two separate entities with little or no interoperability, the two platforms are literally connected to one another and can be used almost as a larger whole. But

TERMS TO KNOW

As you start digging deeper into hybrid cloud computing, there are a few new terms you will come into contact with. Below are some common terms and definitions to help you get a better grasp on the technology.

Intercloud – A perceived future involves the Intercloud, a conglomeration of clouds, much like the Internet is a group of networks combined to make a seemingly single entity.

overdrafting – A situation where an application uses all of its available computing resources, becomes overwhelmed, and shows signs of slowing down or complete failure.

cloudbursting – The ability for data or applications to push out into a public cloud during times of overcapacity. They can then use public cloud resources to continue functioning as normal. This is not heavily used and the concept is controversial.

load balancing – This is used to spread workloads more evenly over computing resources. The idea is to help improve the performance and efficiency of applications.

elastic scaling – The ability for a storage solution to expand or contract in capacity depending on computing needs at the time. This is a major benefit of most hybrid cloud environments and helps counteract overdrafting and other issues.

aside from being able to scale out your cloud to increase capacity almost instantly, there are many other benefits to hybrid cloud

computing that companies need to be aware of.

WHAT ARE THE MAJOR BENEFITS?

When it comes to new technology, one of the first things companies are concerned about is cost. Luckily, with cloud computing, most companies already have an established private cloud, so bringing in an external cloud doesn't force a company to spend any additional money on beefing up internal infrastructure. Instead, most third-party services are "pay per use, so you can use them as little as you want and for a short time as [needed, and] then stop paying for them," says James Staten, vice president and principal analyst at Forrester Research (www.forrester.com). But, of course, if you're a company with fluctuating capacity needs, you can always set up a long-term plan with your third-party vendor and still be able to only pay for the capacity you use.

Sloan also points out that with the recent trend of virtualization and consolidation within data centers, hybrid cloud computing can also aid in freeing up internal resources. "Say we have these workloads that are our bronze level of service," he says. "They're important but they're not critical, so we'll move them to the public cloud. Then, this other stuff that may be highly critical, high-value, and maybe we don't trust it outside of our firewall—we'll keep it under our internal infrastructure."

You can cut down on internal storage because you can move all of your nonessential data onto your external cloud and only store the most important data onsite. But because the two clouds are connected, you can always retrieve that data at any point and bring it back under your control.



"Cloud computing is about low barrier to entry, ability to experiment, ability to turn on quickly, scale up quickly, but also turn off quickly. While cost is a factor, especially for more commodity services, it's agility and speed that are the bigger, longer-term benefits of cloud computing."

Thomas Bittman

vice president and distinguished analyst, Gartner



"Looking into the future, a lot of organizations are saying, 'Yeah, we'll make use of external cloud, but we also see a continued role for internal infrastructure'. When you look at that as the future, then the hybrid approaches start to make a lot of sense, because it gives you the ability to have [this] internal and that external but then be able to manage them together."

John Sloan

lead research analyst, Info-Tech Research Group



"All companies should be examining how they can best take advantage of cloud computing. Their first place to start is probably test and development of new applications, websites, mobile apps, and anything with either transient or elastic resource needs."

James Staten

vice president and principal analyst, Forrester Research

IS HYBRID CLOUD A FIT FOR YOUR COMPANY?

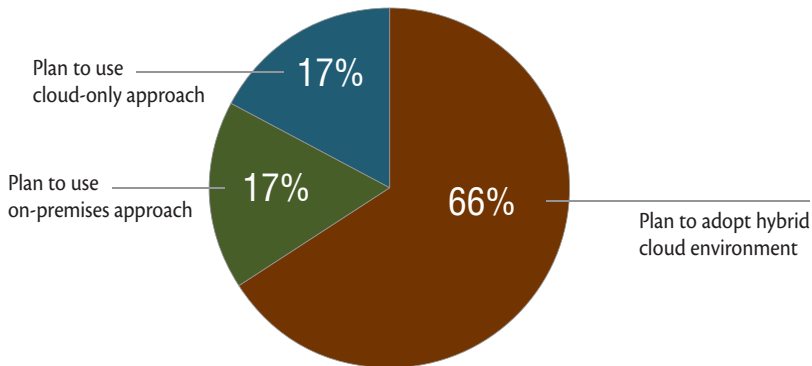
The important thing to remember about hybrid cloud computing is that even though it holds many benefits for enterprises, it isn't necessarily a fit for businesses of all sizes. "Hybrid adds a complexity that should be reserved for larger enterprises," says Bittman.

"Smaller or midmarket enterprises may be virtualizing, and may build private, on-premises clouds, but it will likely be better for them to maintain on-premises private, migrate completely to off-premises private, or migrate completely to off-premises public rather than maintain a hybrid service."

Of those companies for which hybrid cloud computing could

ENTERPRISES MOVE TO THE HYBRID CLOUD

According to a 2011 report from Ipanema Technologies (www.ipanematech.com), a majority of the 150 CIOs and IT directors surveyed claimed they planned to use a hybrid cloud environment for their organizations by the end of 2015. It would seem that Gartner (www.gartner.com) agrees, as the research firm recently included “hybrid IT and cloud computing” among its top 10 strategic trends for 2013. This chart shows some details from the Ipanema study:



SECURITY CONCERNS

There are many benefits to hybrid cloud computing, but there is also a potential security vulnerability that will require preventative measures. “All of the cautions about using the public cloud are still in force [with hybrid cloud computing],” says John Sloan, lead research analyst at Info-Tech Research Group. Let’s say you’re going to do some cloud bursting. You now have virtual servers on-premises and virtual servers in the cloud that are accessing that critical data. You’ve now created a gateway back to your critical data. All the due diligence around if this data shouldn’t be externally accessed are still important considerations.”

be a benefit, Bittman says 75% of them are already “building private cloud services,” and he expects a majority of them to “become hybrid over time.” Staten agrees that many of these cloud instances will “ultimately be private,” but also adds that many companies are already taking advantage of hybrid solutions and that it “isn’t all that different from what we have today.”

And for Sloan, it’s a simple matter of business agility and the needs of individual companies. “A hybrid model has a lot of value for them because it gives them that additional capacity on-demand that can make their infrastructure more agile,” he says.

“An increasingly agile infrastructure is great if you’re an increasingly agile company.”

WHEN IS IT TIME TO JUMP ONBOARD?

If you think your company is a fit for hybrid cloud computing, there remains the question of when you should seriously start thinking about deploying it. Sloan warns that in the current hybrid cloud computing landscape, specifically with third-party providers, there is the potential for vendor lock-in that could limit your options in the future. He hopes for a near future where there are set interoperable standards; he says companies should consider waiting until they

can “just focus on those basic metrics of cost of capacity and management of risks,” instead of whether or not they are going to get stuck with one vendor and not be able to easily move from one to another. But that doesn’t mean companies shouldn’t start researching and building toward that future.

In fact, Bittman recommends that organizations currently entrenched in the private cloud trend should continue to pursue it with “long-term interoperability in mind and hybrid cloud as a future direction.” As hybrid cloud computing continues to evolve, so will the feature sets and flexibility of services. If you can start by building and optimizing your own private cloud with the functionality you need, you should be able to bring in a third-party vendor as a partner, negotiate specific terms, and move into the hybrid space when you’re ready. As with any technology, you need to prepare ahead of time in order to take full advantage of it in the future. ●

If you think your company is a fit for hybrid cloud computing, there remains the question of when you should seriously start thinking about deploying it.



Data Center Convergence

Has The Time Of Silos Passed?

THERE WAS A TIME when silos roamed the land of data center infrastructure as the dominate beast. As Jenna Maertz, Info-Tech Research Group (www.info-tech.com) research analyst spells it out, the traditional silo approach to data center infrastructure essentially involved “your servers and your server admins, your networks and your network admins, and your storage and your storage admins, and never shall the twain meet.” The technologies only overlapped so as to provide integration, and knowledge only overlapped so as to allow this integration, she says. “There wasn’t a holistic sense of the data center or the roles within it.”

It’s the absence of this “holistic sense” that many data center experts believe is why silos are on the way out. Taking their place is the “converged data center,” an infrastructure approach that offers numerous benefits, including a potential reduction in CAPEX (capital expenditure) and OPEX (operating expenditure) savings; improved efficiencies; and enhanced management.

DEFINING DATA CENTER CONVERGENCE

Mark Bowker, Enterprise Strategy Group (www.esg-global.com) senior analyst, uses an analogy of building a backyard shed to describe data center convergence.

To date, companies have built IT “the same way I built the shed, which is going to the lumberyard, getting a bunch of building materials, throwing them in the truck, coming home, throwing them on the lawn, and starting to build the shed,” he says. The approach now is to come up with a blueprint, design, and architecture so that “when I show up to the lumberyard, I know how many 2x4s I need, how many sheets of plywood, etc. I’ve streamlined the process and know what I’ll get at the end.”

Frost & Sullivan (www.frost.com) analyst Anu Elizabeth Cherian says due to ever-declining budgets, companies are wise to eye convergence. Long-term,

Key Points

Vendors are adapting their infrastructure solutions to enable data center convergence, including providing turnkey solutions.

Among the benefits that a converged data center infrastructure can provide are reduced capital and operating expenses.

Another benefit of data center convergence is the ability to share pooled resources that were unavailable in a silo approach.

A drawback of data center convergence can be the need to provide training to staff that previously specialized in only one infrastructure area.

she says, data center convergence can reduce capital and operating costs by taking “data center resources out of predefined tasks and combining them into blocks that are essentially ‘modular.’” Companies can use or reuse these blocks for any type of application within an organization. Conversely, a silo-based approach pre-allocates resources for customized tasks. Once allocated, reusing the infrastructure for new tasks or using any slack capacity for other tasks is very difficult, she says. “By converging data center resources, businesses—with the right management—can take all of their IT infrastructure and make it into building blocks to solve different problems,” she says. “This allows resources to be shared and utilized to a much higher capacity than would be possible in the silo-based approach.”

Brad Brech, a member of The Green Grid’s (www.thegreengrid.org) board, says multiple levels of convergence are happening in the data center industry, both in terms of forming fewer data centers and converging silos of IT resources. In both cases the goal is “to drive efficiencies and reduce cost by widening the scope of shared IT resources,” he says. Beyond the cost of IT equipment, there’s typically a larger savings in the skills required, he adds.

Ben Woo, Neuralytix (www.neuralytix.com) managing director, says “the problem with most business owners, and especially IT leaders/professionals, is that IT is too focused on infrastructure rather than information.” Convergence enables transforming IT back into “its real job” of delivering information services vs. infrastructure services, he says. “The majority of CIOs are Chief Infrastructure Officers, not Info Officers,” he says. Woo equates data center convergence to a holistic environment. “The old saying of the whole is greater than the sum of the parts applies here. Data center equals whole. Silo equals parts.”

Despite the enthusiasm for data center convergence, silos aren’t necessarily irrelevant just yet, because the silo-based approach is dependent on a given application and business needs.



“By converging data center resources, businesses, with the right management, can take all of their IT infrastructure and make it into building blocks to solve different problems.”

Anu Elizabeth Cherian
analyst, Frost & Sullivan



“The problem with most business owners, and especially IT leaders/professionals, is that IT is too focused on infrastructure rather than information.”

Ben Woo
managing director, Neuralytix

“Sometimes, business governance needs to drive the need for siloed approaches, or the inability of workloads to share resources,” Brech says. “These issues are typically becoming smaller in workloads that run in the same architectures, but they haven’t gone away. So while shared resource approaches are gaining, some silos will continue to exist to meet specific business needs.”

CONVERGENCE COMPONENTS

Core components involved in data center convergence include storage, networking, servers, and virtualization. Also key is planning how to integrate and manage these pieces.

In the past, Bowker says, the approach was to first think about how to manage servers and how to get analytics and performance measurements from them, and then think about how to do the same for the network, bandwidth, and the storage system. This approach, Bowker says, can lead to headaches in terms of having to troubleshoot or look at applications that have complexities that affect all three. Convergence enables using management tools that layer on top of the servers, storage, network, etc., and takes advantage of virtualization to gain visibility and monitoring abilities and potentially set policy.

“So being able to look at management tools that actually layer on top and take advantage of what’s already happening in virtualization, have awareness, and have intelligence fed from [servers, network, and storage] be able to be visible and monitor and maintain and potentially set policy upon through a management tool is a key piece to actually moving in this direction,” he says.

Brech counts three “front-burner elements” as fundamental components, the first being an ability to disconnect the workload from the physical resources using some form of virtualization. “There are many levels of virtualization available, some at the workload execution level in the OS and some at the IT resource (compute, network, storage) level. The latter has become the focus of many consolidations,” he says. The second element includes management tools for the shared infrastructure and an ability to operationally support the workloads. “Without a good plan and the right tooling, the complexities of shared resources could eat deeply into the savings,” he says. The last element is “a real understanding of the workloads, their resource needs, their operational dynamics (peaks and valleys of capacity), and the business SLA/QoS requirements,” Brech says. Many vendors

provide tools to assist in the workload analysis, he says.

BENEFITS & DRAWBACKS?

Beyond potentially reducing the data center's footprint and saving costs, converged data center infrastructure can provide more flexibility for resources, help avoid vendor lock-in, and enable the company to view the data center as a way to create value vs. simply as an infrastructure. Other benefits include quicker provisioning of applications, easier scaling, and a greater utilization of resources.

"Two of the most prevalent benefits are the improvements in economics of the data center and the increased agility in responding to new workloads by deploying and redeploying them in a common resource pool," Brech says. "The deployment/redeployment replaces the old practice of bringing in all new infrastructure for every new workload. Greatly reduced time to deployment helps drive responsiveness and business value, ultimately saving money." Bowker says data center convergence also relates to IT processes and policies. "Once you've pooled resources, you can draw upon them much more efficiently than [in] the past," he says. "It's ultimately being able to share the resources that may have been available in a siloed approach but [you] were unable to actually tap into them due to how they were configured and managed."

Drawbacks associated with data center convergence, meanwhile, can include those related to staffing. "You will have your network guy and your server guy, and both of them know their own technology inside and out, but they know very little about the other's technology because up until now, they really haven't had to," Maertz says. With Convergence, companies will need people who know networking, storage, and servers and how they interact. Maertz says companies should expect to train staff to help "align these traditionally siloed roles with the new reality of converged



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Jenna Maertz

Consulting analyst, Info-Tech Research Group



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Brad Bowker

senior analyst, Enterprise Strategy Group

infrastructure and a broader role of data center administrator."

Companies can avoid some drawbacks by planning the transition to converged infrastructure. For example, Cherian says, "If you cannot easily add new resources without significant redesign to your converged data center, companies will have long-term problems." Additionally, if existing applications are especially reliant on one compute resource vs. another, the converged environment design should account for this. Brech also advises conducting a good analysis of middleware stacks so as to ensure that your company doesn't break SLAs when converging.

THE VENDORS

Woo believes that any infrastructure vendor that claims to be just a storage, networking, or server vendor will be irrelevant within three years. "This is an all or nothing game," he says. Cherian says some current infrastructure vendors are facilitating hardware

interoperability, virtualization at all levels, and standards compliance. Beyond components that enable convergence, Brech says, vendors are providing tools and services to ensure components are successful, noting there's a broad spectrum now available.

In the last 18 months, Bowker says larger vendors have gone through a packaging and pricing exercise to deliver what they did previously from a server, storage, networking perspective but with a wrap around them and in a package with a single SKU that's easier to consume. In some cases, he says, vendors are working together to deliver solutions, while elsewhere an emerging set of vendors is delivering similar capabilities as larger vendors. Some of these are taking a slightly different approach by designing storage, server, and pooling capabilities on x86 hardware, he says, and "maybe putting some additional hardware acceleration in there depending on the company and [delivering] that in a very simple, easy-to-consume manner." ●



Software Audits

The Dos & Don'ts Of Managing Software

FOR SOME COMPANIES, a software audit is synonymous with a dark cloud looming on the horizon. A company prepared for the storm may walk away more or less unscathed and even find itself better-positioned for the long term. A company ill-prepared, however, may be left picking up the pieces and feeling the storm's aftereffects for a long time to come.

For many companies it isn't a matter of *if* a software audit will strike but *when*. A company that poorly manages its SLAs (software license agreements) only increases its odds. Worse, the ramifications can include hefty fines and penalties, as

well as a hit to the reputation and future negotiating power with software vendors. For these reasons and more, it pays to be proactive when it comes to SLA management and preparedness, with the end goal of being able to effectively tackle a software audit if it should occur.

POSSIBLE TRIGGERS

A variety of events and conditions can trigger a software publisher or vendor to request a software audit. Among these is a company that fails to enact proper control and oversight over its SLAs. Often, however, a vendor will trigger a software audit

not because the company has done something wrong, says Sandi Conrad, Info-Tech Research Group (www.info-tech.com) world class operations practice lead, but because a vendor is executing an "efficient expedition." For example, Conrad says, Info-Tech sees random audits done where the vendor looks at an account and says, "'Yeah, we haven't see much happening there lately. Let's give them a call.'" That happens fairly frequently."

Another trigger can relate to when a company makes changes to a licensing agreement, such as when moving from an all-inclusive agreement that integrates maintenance,

Key Points

The ramifications of a software audit can include fines, penalties, and hits to a company's reputation and future negotiating power.

... Poorly managed SLAs, disgruntled employees, a down economy, and on-site vendor visits can trigger audits.

... Implementing a discovery tool with usage reports is recommended to show what software is installed and where.

... Cooperating with an audit and learning from the experience can be the best approach to take when approaching an audit.

support, insurance, and other facets, to a more select agreement. For the software publisher or vendor, such a move represents a sudden loss of revenue and may trigger an audit in order to learn why the business is making the move. Audits can also occur simply because a contractor is on-site and notices the company is drastically out of compliance.

Another occurrence companies can experience is a vendor making an “effective license position” inquiry, in which it offers the company its assistance, Conrad says. Basically, this is tied to the vendor’s sales process and involves the vendor seeking an audit to determine if there’s anything it can sell to the client; it generally is not something the publisher triggers. In such cases, Conrad says, the audit is “absolutely optional.”

EMPLOYEES & THE ECONOMY

Two entities often cited as being instigators of software audits are disgruntled employees and a down economy. The former may involve, for example, a resentful former employee reporting alleged copyright violations to the BSA (Business Software Alliance), Conrad says, something the former employee can do easily and anonymously. Furthermore, the BSA offers rewards, which can fuel incentive.

Typically, such an occurrence involves the BSA—not the actual software publisher or vendor—contacting the company on behalf of a vendor. For a company, Conrad says, this “becomes a much larger issue, becomes much riskier, and potentially a much bigger financial impact.” Fines, for example, can total three times that of a software title’s

retail price, she says, making a BSA audit potentially very expensive. Conrad says the majority of audits, however, “are done by the software manufacturers and publisher rather than the BSA. And those aren’t as antagonistic. They tend to be much more ‘Let’s help you become compliant,’ and they tend to be a little bit friendlier.”

A down economy, meanwhile, can propel some software publishers and vendors to seek added revenue through software audits. “The publishers will all deny that, but it does seem to happen a lot more when the economy is down,” Conrad says. “In part because they’re fishing for additional revenue, but in part because the feeling with the vendors is that if a company is suddenly cutting off all of its expenses—unless it’s actually laying off people and not doing any innovation with their technology—then there’s a concern that they might be stretching their license a little bit thin.”

WHAT’S AT STAKE

From the publishers’ perspective, software audits are a means of protecting their intellectual property against abuse by companies; audits ensure they are being appropriately paid for their products based on licensing agreements. Fines and penalties are incentives for companies to remain in compliance with those agreements. Cloud computing can prove to be a different sort of thing, Conrad says, as cloud vendors typically are able to know who is signing into an application or module and can automatically bill companies based on usage. Conrad says it’s up to the company to understand who is using what, and if the company fails

to do so, it “won’t necessarily fail an audit, but [it] may end up paying a lot more than anticipated.”

Conrad says that to a certain degree companies possess a high level of awareness about what’s at stake if they were to fall out of compliance with SLAs. “What we see especially in small and medium-sized companies overall is that they do want to stay compliant; they just don’t put the resources into seeing that they are compliant,” she says. “What we see a lot is companies weigh the risks based on the probability of getting audited, not necessarily thinking about the actual risks to their companies.”

Beyond financial risks, companies also risk their reputation being damaged. The BSA, for example, publishes details concerning who it has audited and the fines levied. A software publisher doesn’t typically publish such information, Conrad says, but an audit “almost puts a flag on the account.” Thus, a vendor may note that a company has failed an audit and isn’t putting a lot of resources in place to prevent an audit from happening again. Therefore, the vendor may make a point of checking back on the company in, say, 18 months.

Conrad says companies that don’t put a formal software asset management process in place may find they’ll get audited a lot more and by the same vendors. “And really, it’s a small vendor community. So if you do have one software publisher that’s continually auditing quite often, you do see other software publishers start to audit, as well,” she says.

Audits can also hinder a company’s negotiating power. If an audit indicates a company has 100 licenses installed, for example, the vendor will mandate the company buy 100 licenses. “As a consumer, you don’t really have that ability to say, ‘Yeah, but we’re only actually using 50. So if we uninstall 50 right now it wouldn’t change the way we do business,’”

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Conrad says. “The vendor would say, ‘Yeah, but you have them installed so you have to pay for them.’” This is really where the benefit of managing installed software comes into play, Conrad says, as it enables the company to see what software is where and remove what isn’t being used.



“What we see especially in small and medium-sized companies overall is that they do want to stay compliant; they just don’t put the resources into seeing that they are compliant.”

Sandi Conrad

world class operations practice lead, Info-Tech Research Group

BEFORE & AFTER

Why more companies don’t have software asset management processes in place can largely be traced back to risk of probability, Conrad says. One mentality a company might have, for instance, is, “Well, we’ve been audited, so we should be fine.” A lack of resources is another reason companies lack management processes.

“It’s kind of a big process to put into place, and quite frankly from a business perspective, the business doesn’t really benefit overall from a software asset management practice. It’s really the IT department that benefits,” Conrad says. “When an IT department is short-staffed or working on business-improvement type projects, they don’t really see the value of allocating a lot of resources over to that utility type of process. They just don’t have the same business drivers to put software asset management into place.”

Because setting up a software asset management practice can be daunting, Conrad advises companies to start by focusing on the top 10 vendors based on spending, as these are more likely to conduct audits. “Obviously, you’ll want to make sure everything else is covered, but if you focus on those top 10 vendors first, it will allow you to reduce the risk most dramatically,” she says.

Implementing a discovery tool to uncover what’s actually installed is

also recommended. A tool that provides usage reports is even better, as it can indicate a software title is installed on 50 machines, for example, but only 20 people are using it; in this case the company can uninstall those extra licenses.

Conrad also recommends closely reading software agreements and EULAs to understand the details and ensure usage is followed as described. Ultimately, she says, companies should assign someone to oversee the management program. While this doesn’t have to be a full-time position and can be divided among several people, she says, someone should be responsible for managing software assets.

BEFORE, DURING & AFTER AN AUDIT

The biggest stressor related to when an audit happens can be fear of the unknown. The best way to proceed is to cooperate, learn from the experience, and stay calm, Conrad says. For example, a vendor may call a company, indicate it’s planning an audit, and immediately begin asking what programs are in use, by how many users, etc. Rather than attempt to provide all information immediately, she says, inform the vendor you need to get a better feel for the

software in place and schedule a date to reconnect.

“If a company starts throwing out numbers before it really knows, it sets the expectation with the vendor that there are potentially more licenses in place than [there truly] are,” Conrad says. If the vendor asks, for example, if a majority of company employees use a particular title and the company says “yes,” the vendor will have that number in mind. “When the vendor does the audit and the company doesn’t have that number of licenses, there’s a disconnect,” Conrad says. From here the audit can become a negotiation and more antagonistic, with the vendor requesting proof based on the company’s early (and possibly erroneous) responses.

After the audit, Conrad recommends learning from the experience not by simply being relieved the audit is over, but by noting where improvements in organization, management, etc. are possible. It’s best, she adds, to “put something in place so you’re prepared the next time it happens.” Going so far as assuring the vendor you will implement certain asset management processes may even delay the next audit, she says. ●



The biggest stressor related to when an audit happens can be fear of the unknown. The best way to proceed is to cooperate, learn from the experience, and stay calm.



Real Cost Of The Cloud

Eliminate Unexpected Expenses Through Planning

CLOUD COMPUTING has a reputation for helping businesses become more agile while simultaneously reducing costs. However, many companies that take to the cloud eventually encounter unexpected costs and/or hidden fees. These can stem from poor planning (over-allocating resources, selecting the wrong pricing plan), unintentional human error (leaving unused servers powered on only to rack up on-demand fees), or oversight (discovering unexpected fees down the road).

THE UNEXPECTED

How often businesses encounter unexpected cloud-related costs is difficult to say, says Amy Larsen DeCarlo, principal analyst, security and data center services, with Current Analysis (www.currentanalysis.com). Based on anecdotes, she believes it's common but adds, "I'm not sure it's any more common than it is in any similarly extensive effort."

Small and mid-sized businesses transitioning application workloads to the cloud, she says, can experience unexpected costs related to migrating legacy applications into the new environment and integrating cloud and non-cloud applications.

"There are many costs associated with migration to the cloud that organizations often underestimate or overlook," DeCarlo says. These include resources required to develop an optimal migration plan, testing and development, and activities associated with ensuring and proving compliance in regulated industries. Other examples include licensing costs not accounted for in advance of deployment, and application maintenance issues. Overall, DeCarlo says, organizations must have a realistic time frame and a migration plan that accounts for testing, staffing, and technical resources necessary to support a cloud effort.

Sam Barnett, directing analyst, data center and cloud, with Infonetics (www.infonetics.com), says unforeseen costs occur often. The reasons behind these costs vary depending on the complexity of a given cloud transition. "In some cases, connectivity is insufficient to support the needs of the business, or perhaps the cloud provider lacks certain expertise to support a group of applications, and those costs may be passed along to the subscriber," he says.

Most large cloud providers, Barnett says, have developed strong data-moving skills, usually taking a snapshot of the subscriber's data, transporting it via bulk media, and loading it at the provider's facility. A relatively well-understood transactional process is then used to bring data current, he says. Typically, companies maintain parallel operations for a period of time to ensure stability of the outsourced solution prior to the final cutover. Most cloud vendors

will price this service into the initial proposal, he says.

Joe Clabby, president of Clabby Analytics (www.clabbyanalytics.com), says unforeseen costs can stem from additional licensing fees, increased energy consumption, and human labor/management requirements. Security and application performance management are common areas where unexpected costs can occur, he says.

Considerations include tracking and securing data as it travels through the cloud, ensuring authorized users are able to access the data, and tracking the course of applications as they (and the customer-specific data associated with them) travel back and forth to the cloud. In terms of security, there are costs involved in authentication, authorization, and general expertise, while application behavior requires application performance management tools, Clabby says. Finally, there is the human labor required to implement and monitor security and to track application behavior.

PICK YOUR PRICE

Given that unexpected costs can arise with any endeavor, it is important to select the appropriate cloud pricing plan at the outset. Clabby advises choosing the right servers and systems when doing so, and ensuring they can execute required workloads efficiently. "In the end, it's all about matching workloads to systems to achieve maximum efficiency," he says. Barnett says it's important to understand the benefits and pitfalls of a "bargain" pricing plan, particularly if the business isn't well-versed in the nuances of outsourcing. Do your homework, understand the provider, and ask questions, he advises. Otherwise "you'll regret it later."

DeCarlo says it's critical, when selecting a service, to thoroughly investigate the differences between multiple options at varying price points. "What appears to be the least expensive on paper may not actually



"The cloud puts a fine point on IT's importance in helping keep operating costs in line."

Amy Larsen DeCarlo

principal analyst, security and data center service, Current Analysis



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Sam Barnett

directing analyst, data center and cloud, Infonetics



"In the end, it's all about matching workloads to systems to achieve maximum efficiency."

Joe Clabby

president, Clabby Analytics

be the best cost fit for an organization that requires additional capacity," she says. Specifically, carefully determine pricing around adding and decommissioning resources, she says. "Take your time developing an appropriate plan and test, test, test," she says. "Not every application works for every organization in the cloud right now."

As for ongoing maintenance and support costs, Clabby says to watch for licensing costs. "For instance, in the VMware world, you get charged for how much memory you use. If you exceed a threshold, you pay more."

DeCarlo says that in unmanaged cloud environments, the client is still responsible for managing the virtual machines and the software running on them. Application bugs and other issues can require significant support resources to correct, she says. "The cloud puts a fine point on IT's importance in helping keep operating costs in line. [The cloud] can also potentially highlight an IT organization's ability to support revenue growth directly by helping expedite the time the

organization takes to get new products to market," she says.

IT & COST MANAGEMENT

One way some companies are working to control cloud computing costs is by using cloud management tools that can provide insight into costs along with automation and optimization abilities. Such tools are still in their infancy, however, and DeCarlo says they still need work. Although "there are pockets of excellence" in this area, Barnett adds, there is still a "long way to go."

In terms of the cost aspect of choosing a cloud service, perhaps the most important thing to consider is who is involved in the purchasing. In the past, this responsibility might have been chiefly IT's domain. Now, business units are sometimes choosing their own technology. Regardless of where the final decision lies, it is best that multiple parties be involved—IT, specific business units, and upper management, for example—so there are no cost surprises down the road. ●



Cloud Service Providers

10 Key Considerations For Choosing The Right Ones

TYPICALLY, MOVING TO THE CLOUD is a process that entails making one key decision after another, not the least of which is deciding which cloud provider the company will entrust with its data (and, essentially, its business) to for the foreseeable future. For all the benefits that utilizing cloud services can provide small and mid-sized businesses, realizing those benefits will be difficult, if not impossible, if the company fails to develop a strong, trusting relationship with a cloud provider that can deliver the performance, security, and other features the company needs, as well as grow with the company. To that end, the following are 10 areas to consider when selecting a cloud service provider.

SUPPORT

It's a virtual guarantee that before, during, and after a move to the cloud, a company will need to obtain support from a cloud provider.

The question is how well-positioned will the provider be to provide that support. One train of thought is that a cloud provider should be able to offer the same quality of support that a provider of on-site services could. When evaluating cloud providers, check the levels of expertise that are available, the vendor's ability to provide live support, what support-related costs might be involved, and what the vendor's reputation is for providing support. Although feedback in forums can often skew to positive and negative extremes, it is worthwhile to check support forums to get an idea of what actual users are discussing related to a potential cloud provider or service.

CREDIBILITY

Although cloud computing has gained significant ground in terms of earning acceptance among com-

panies, the industry is still relatively young. Thus, primary concerns when it comes to entrusting data to a third party include the provider's credibility and a proven ability to deliver on its promises over the long haul. To help draw conclusions, check and verify the various processes (maintenance, upgrades, etc.) the provider has in place. Admittedly, this can be a daunting task, as you may face a deluge of information from potential vendors and not easily recognize possible gaps that should prompt further investigation. In that case, it is beneficial to review material from the numerous research and analyst firms that have compiled vendor comparisons based on an ample range of criteria.

VALUE-ADDED SERVICES

While the basic services that a cloud vendor can provide are undoubtedly important, for many

companies it is the availability of value-added services that will ultimately sway the decision between one cloud vendor and another. This is due somewhat to the fact that the basics offered by particularly larger cloud service providers are becoming fairly equal while the extras offered can differ considerably. For example, one cloud storage provider may offer database services while another does not.

As vendors increasingly make it worthwhile to serve as their customers' sole choice in cloud provider, thanks to a combination of proprietary functionality and cost-effective service bundling, it becomes more important that you consider each vendor's entire breadth of services, including value-adds and niche features. Doing so helps you avoid surprising holes in service and interoperability problems down the road.

PARTNERSHIPS

The burden of compiling all the pieces necessary to make a move to the cloud can prove extremely time-consuming and difficult, especially for smaller businesses with already overtaxed IT personnel who shoulder multiple responsibilities and may lack expertise or skill sets in cloud-related areas. In such cases, the partnerships a particular cloud provider has formed with other companies (such as an appliance vendor) that it can pass on to the customer can prove valuable. The provider may, for example, offer an attractive, convenient, and cost-effective turnkey solution that is just right for your business.

SLAs

Nearly all advice pertaining to making a move to the cloud eventually touches upon SLAs (service level agreements). Some experts, in fact, declare that any company initiating an agreement with a cloud vendor should go beyond the provider's

standard SLA and instead negotiate for an SLA that pertains specifically to the company and clearly outlines the penalties and sanctions the provider will abide by if it fails to deliver on the stated service levels.

Some experts suggest settling for SLAs that indicate the provider will reach nothing less than 11 nines (that is, 99.999999999%) uptime. Whatever your level of involvement with a cloud vendor, it's in your company's best interest to fully understand the SLA; in particular, it's vital to know the conditions that must exist for the SLA to be applicable.

PERFORMANCE

Even the most ardent supporters of cloud computing will admit that cloud services are susceptible to some performance issues. This can be particularly true in cases where a great deal of active data travels back and forth between the company and a public cloud provider. In addition to performing a proof of concept to check performance, various experts advise to determine how many outages a provider has had and what the provider's track record is for rebounding from network, hardware, and other failures.

MANAGEMENT TOOLS

One area in which cloud computing offerings can sometimes need improvement is in the quality and availability of various management tools. These include tools that provide oversight into on-premises and cloud-based storage, management of services from multiple cloud providers, and insight and control over cloud usage and billing.

Depending on the specific case, acquiring new personnel and third-party tools might be necessary to satisfy requirements. On the flip side, some cloud providers are building solutions directly into their services. Some cloud storage vendors, for example, integrate automated backup and archiving abilities.

TERMINATING THE RELATIONSHIP

Not all relationships are meant to last, and this can include a company's relationship with a cloud provider. The problem is that once a company moves a large chunk of data to the cloud, it can be difficult to move it back out. Thus, many experts strongly recommend that a company have a plan in place for exiting the cloud that addresses the conditions under which the company can end the relationship, how data/systems will be removed and possibly ported to another provider, the various costs expected, legal ramifications, and related concerns.

CUSTOMIZATION & GROWTH

One way cloud experts suggest companies can possibly save money when moving to the cloud is by selecting a provider able to tailor services to a company's specific needs, something that likely will mean forging a long-term cloud strategy. Developing a strategy, in turn, requires ensuring a provider has the infrastructure and resources in place to scale as the company grows. Thus, determine what, if any, limits a provider places on customers and how easily it can scale and add resources per customer need.

SECURITY

Arguably the biggest and longest running concern with cloud computing relates to security, particularly where it concerns a company's data and privacy. These are chief among the security traits a company should check for: whether encryption is in place; what compliance standards the provider follows; third-party audits performed; reports, audit results, and other documentation provided; protection employed to combat cyberattacks; types of access control, authorization, and authentication enlisted; and the physical protection and redundancies used against natural and manmade disasters. ●



Natural Disasters

Is Your Company Prepared?

WITH THE U.S. REACHING the milestone in 2011 of suffering 14 natural disasters exceeding \$1 billion or more in damage (per insurer AON Benfield), insurance firms and governments are urging businesses to increase their preparedness for extreme events. Yet, according to a Natural Disaster Business Risk study of financial managers published in 2010 by insurer FM Global (www.fmglobal.com), 96% of respondents had operations in areas subject to natural disasters, yet fewer than 20% reported their firms were “very concerned” about the events’ potential effects.

The FM Global report delves into the reasons for such behavior, which

include humans’ natural inclination to engage in denial and our inability to accurately calculate risk.

“Many small and medium-sized businesses think they don’t have time to develop a plan for dealing with a natural disaster,” says Gail Moraton, Business Resiliency Manager, IBHS (Insurance Institute for Business & Home Safety; www.disastersafety.org). She says disaster recovery preparedness is achievable for any firm.

If your disaster preparedness plan consists of automated, redundant server backups or employees working from smartphones you need more than natural disaster planning. The Internet is

littered with advice on how to create a full-fledged BCP (business continuity plan) or DRP (disaster recovery plan).

PEOPLE

According to Kevin Knox, a research director and disaster recovery specialist with Gartner (www.gartner.com), people are key to disaster preparedness, and yet human resources are often ineffectively addressed. “It’s not just about technology recovery. Workforce resiliency and redundancy are important, as well,” he says. “Where will your people go if you have a long outage? Have you planned for dedicated workspace recovery or mobile recovery?”

Key Points.....

Natural disaster preparedness plans don’t have to be complex; in fact, simple plans may have a better chance of successful execution.

Reopening quickly after a natural disaster, even at a very rudimentary level, is important to business continuity.

A company’s choice of partners is an important aspect of disaster preparedness.

Companies should not count on the availability of key personnel following a natural disaster.

Knox says the uptake of smartphones and tablets as mobile productivity tools is propelling the ability for employees to work from home or another remote location. Nevertheless, he cautions firms not to take for granted their mobile productivity solution is flexible enough to keep the business running. In a natural disaster, Knox says, it's important that companies be able to access data and applications—and on a data provider's hardware, rather than the firm's internal hardware—to ensure continuity.

Furthermore, he says, "Don't assume a particular person is going to be in Location A and be able to do something. . . . They may not be able to get to the recovery location."

Jim McGregor, founder and principal analyst at Tirias Research (www.tiriasresearch.com), concurs, pointing out that businesses have no way of knowing which employee's home will be flooded or which roads will be icy or blocked by fallen trees during a natural disaster. So companies have to consider employee availability completely unpredictable.

To combat this problem, Knox recommends companies devise a simplified preparedness plan and documentation for natural disasters, even if they have a more complex plan for other recovery events.

PRODUCTS

Disaster preparedness plans often include extensive "critical business function" assessments with detailed scenarios for keeping accounting, procurement and other normally essential functions operational. However, Moraton agrees with Knox's "simple is better" approach and says it should also apply to critical business functions.

"Consider the operations that enable you to open your doors, and figure a way to keep those going in the short-term," she says.

According to IBHS' research, 25% of companies that don't open their doors shortly after a natural disaster never reopen. Keeping service to customers at some level will not only help you avoid



"Many small and medium-sized businesses think they don't have time to develop a plan for dealing with a natural disaster. We tell business owners: 'Take it one step at a time.'"

Gail Moraton

business resiliency manager, IBHS



"Plan around the number of scenarios you can manage. . . . Then make the plans so simple that anyone can execute them without specialized expertise."

Kevin Knox

research director and disaster recovery specialist, Gartner

being a statistic, but it will also endear you to your customers.

PARTNERS

When considering the impacts of a natural disaster, resilient firms extend their plans beyond the office to ensure they partner with equally resilient firms, says McGregor. "If your Internet service provider, your cloud vendor, your communications company are located in the same area as you—or in a disaster-prone area—it's important to investigate their resiliency," says McGregor.

Furthermore, he notes, "When vendors tell you they have redundancy, are they talking about two server racks next to each other, or do they offer geographic redundancy? Does that redundancy extend to delivering your data and services from the redundant location, or is it intended for backup recovery only?"

According to Moraton, supply chains are another area that companies should evaluate closely. Richard Herrin, Director of Supply Chain Management at Georgia Gulf Corporation, agrees. "Natural disaster supply-chain planning can be part of a bigger effort called integrated business planning, or IBP, a demand-supply balancing model that incorporates supply risk management. In a perfect world, our suppliers are

100% on time, in full. In the real world we have to ask ourselves, 'If a vendor goes down, do we have alternate suppliers? Do our suppliers hold safety stock?' Companies that ask and answer those questions in advance of a natural disaster better position themselves to survive its impacts," says Herrin.

KEEP IT SIMPLE

All our experts focused not on the importance of 400-page preparedness plans but rather on simple strategies for keeping companies open for business:

- Develop workable, simple plans for a manageable number of scenarios.
- Share the important tenets of plans with all employees.
- Train everyone to execute core functions or make them so simple that anyone can figure them out.
- Tell everyone where critical information is kept.
- Partner with resilient vendors.
- Be prepared for the unexpected.

Our experts also recommend that businesses update plans and run periodic drills to ensure they don't blow up under pressure. "Disaster recovery plans have to be living documents," Moraton says. "If they're sitting on a shelf, they're not doing anyone any good." ●



Cloud-Based WLAN Management

We Look At The Benefits & Concerns

AS MORE SOFTWARE functionality becomes available in the cloud, it makes sense that the WLAN (wireless local area network) management vendors would try to take advantage of the trend and give customers an alternative to traditional, on-premise controllers. While companies may be wary of simply moving every piece of technology off-premise in an effort to save resources, there are benefits related to cloud-based WLAN management that shouldn't be ignored. Not only can these solutions prevent massive upfront costs, but they can also give companies more control over access points and free them from the constraints of on-premise management.

TRADITIONAL VS. CLOUD-BASED WLAN MANAGEMENT

The difference between traditional and cloud-based alternatives has less to do with network performance or feature-sets and more to do with where the WLAN controller is located. For companies, it's a simple question of "Do you have a controller on-premise or does that controller live outside of your premises in the cloud?" says Mark Tauschek, lead research analyst with Info-Tech Research Group (www.infoltech.com). Traditional and cloud-based WLAN management provide the same basic functionality, except for when it comes to how they interact with your network and the freedom that cloud-based solutions provide.

"The interfaces for both tend to be very similar," says Jim Rapoza, senior research analyst for the Aberdeen Group (www.aberdeen.com). Also, the types of administrative capabilities that you get will be nearly identical, making it possible to monitor, manage, secure, and provision your various wireless devices. The main difference is that traditional WLAN management is tied to specific devices, corporate networks, and business network management systems, while a cloud-based system, since it's in the cloud, can reach down to managed devices wherever they are located."

BENEFITS

Aside from giving IT administrators the freedom to control access points and push out policies from almost

any location, cloud-based WLAN management solutions also provide a cost-saving measure for companies based on their specific implementations. "The real difference between the models now is . . . you have an on-premise capital investment that's managing access points that exist on your premise," says Tauschek. You pay for a WLAN controller, you have your IT staff implement it and manage it, and the entire process is handled on premise. He says that with cloud-based alternatives, however, you "pay a monthly or annual subscription for each access point you're going to manage, so it flattens your cost." Tauschek warns, however, that companies should be careful when selecting a cloud-based WLAN management service, because "in the longer term, your TCO is probably going to be higher."

Availability is another feature that separates cloud-based solutions from traditional alternatives. For instance, if your centralized, on-premise WLAN controller goes down, it could potentially cripple the network and prevent access points from working correctly; if a cloud-based WLAN controller goes down, it will be an inconvenience but not as severe. "If the console goes down, you can't make policy changes to your access points and you don't have any visibility into what's going on in your network, but because the access points have intelligence, it just continues to run the way it would have before," says Tauschek.

In addition to these benefits, Rapoza would also place improved monitoring capabilities on the list. He says that cloud-based management "offers some very compelling capabilities, providing real-time analytics, diagnostics, and troubleshooting, and makes it possible to do all of this from a geographically diverse viewpoint." If your company has multiple offices, "you could see the status of the WLANs at all of your locations across the country."

SECURITY CONCERNS

While cloud-based WLAN management solutions have benefits, you do



"By making it possible to easily deploy, manage and support wireless networks across all of a company's locations, cloud-based WLAN management can greatly ease the support burden of maintaining these networks and make it possible for companies to easily offer WLANs wherever they are needed."

Jim Rapoza

senior research analyst, Aberdeen Group



"The way that it is today, cloud-based WLAN management is probably easier. From an administrative perspective, it's easier to manage and it will certainly be easier to get into for a smaller organization and for smaller networks."

Mark Tauschek

lead research analyst, Info-Tech Research Group

need to be aware of potential security issues. "While the actual networks themselves are separated from the cloud, since the management interface is basically on the public Internet, you'll want to ensure that it is using secure connections and has strong access policies in place," says Rapoza. Ensure that a vendor's security practices align with your company's policies.

NOT A FIT FOR ALL COMPANIES

Cloud-based WLAN management solutions are not necessarily a fit for all companies. Depending on your implementation, the total cost of ownership for a cloud-based solution with a subscription could be more in the long run than a one-time on-premise purchase. The size of your company is also something you need to consider.

Tauschek says that for bigger organizations, such as retailers, with large networks and only a handful of access points, "a cloud-based solution

is probably going to [be] better because it's easier to manage all of those locations." Smaller companies can also benefit from cloud-based WLAN management because they can "flatten costs" and not make "a big capital expenditure upfront." But centralized organizations with large campuses should probably stick with on-premise WLAN management because "all of the traffic is traversing the LAN, there's more capacity, and you're managing a lot of access points in a single location," says Tauschek. As with any IT purchase, it's important to consider your company's needs when deciding between a traditional WLAN management solution and a cloud-based service. Both options have their own unique benefits, but cloud-based WLAN management is certainly worth looking into, and it is a technology that should continue to evolve. "It's not the right or the ideal solution for everyone, but it can be pretty compelling under the right circumstances," says Tauschek. ●

ENERGY-CONSCIOUS TECH *Greenovations*

The electronic devices that make our lives easier also produce some unwanted side-effects on the environment. Fortunately, many consumer electronics manufacturers and businesses are working to create products that keep us productive while reducing energy demands to lessen our impact on the environment. Here, we take a look at the newest environmentally friendly technology initiatives.

SPRAY-PAINTED SOLAR CELLS AIM TO DECREASE COSTS

► Researchers at the University of Sheffield in the UK, with help from the University of Cambridge, have developed a new manufacturing process where machines can effectively spray-paint solar cells onto plastic semiconductors. This process is less expensive and much less energy intensive to use than traditional methods and leads to relatively similar results.

Although today's plastic semiconductors are not quite as efficient as silicon ones, researchers continue to investigate methods for improving the performance of plastic due to the material's high potential and low cost. In addition to making the spray-painting process possible, the use of plastic opens up other opportunities, including the ability to create curved solar panels. One Sheffield University researcher says the spray-paint application could be used on the roofs of buildings and cars to generate electricity.

DESIGNER CREATES MAP OF POTENTIAL U.S. HIGH-SPEED RAIL SYSTEM

► It's no secret that some members of the U.S. government, including President Obama, are interested in developing a high-speed rail system that crosses the United States from border to border and coast to coast. Some entities, such as the state of Florida, the Ohio Department of Transportation, and the California High Speed Rail Authority, to name a few, have even proposed plans to provide high-speed systems that would cover smaller portions of the U.S. in an effort to make this public transportation dream a reality.

To illustrate the potential routes, Alfred Twu, a designer from California, developed a graphic that shows just how all of these smaller legs would fit together to make an expansive high-speed rail system. With trains running at an estimated 220mph, a traveler could consult Twu's illustration and see that traveling from Miami to Washington D.C., for instance, would take roughly seven hours.



Alfred Twu's high speed rail design incorporates plans from multiple institutions and illustrates how transportation in the U.S. might look with such a system in place. Trains on the high-speed system could reach maximum speeds of 220mph.

GLOBAL SOLAR POWER SURPASSES 100-GIGAWATT CAPACITY

► According to a recent report from the European Photovoltaic Industry Association, the worldwide solar global capacity has surpassed the 100-gigawatt milestone thanks in part to 30GW of solar PV (photovoltaic) projects implemented in 2012. Germany was the biggest achiever last year with 7.6GW of solar PV systems installed, while the U.S. implemented projects totaling 3.2GW of capacity. As innovation continues in the solar industry, it's possible that these figures could climb higher, but even in its current state, researchers say the level of growth is surprising as it was achieved during a low point in global economics.

ORGANIC MOLECULE COULD REPLACE SILICON IN SEMICONDUCTORS

► In an international partnership between teams at the University of Washington in Seattle and the Southeast University in China, researchers discovered a new ferroelectric molecule that could be a potential organic alternative to silicon-based semiconductors in memory chips and sensors. This new organic molecule has a synthetic cousin known as barium titanate, which researchers say is the current performance standard in the industry. However, the ferroelectric molecule University of Washington and Southeast University in China researchers discovered actually displayed better efficiency during the testing process. Researchers are still in the process of determining exactly what this new molecule is capable of and what types of applications are most appropriate for it. Because similar synthetic ferroelectrics are being used in manufacturing already, it's possible that this new molecule could be used in smartphones, tablets, and other mobile devices.

BELGIUM CONSIDERS ARTIFICIAL ISLAND FOR WIND POWER STORAGE

► The North Sea and the surrounding land is a great region for wind farms, but one downside is the lack of space to store the excess energy derived from those farms that isn't used by the nearby electricity grid. To overcome this obstacle, Belgium has created a concept and design for an "energy atoll" that would be built on the North Sea and used to collect and store excess energy during off-peak hours from existing wind farms.

The island would sit roughly 1.86 miles from the shore and would be approximately 1.49 miles wide.

The way that this artificial island would store the energy is quite interesting in its own right. It would actually bring in energy in the form of water pumped out of the atoll and into a reservoir during off-peak hours. During peak hours, this same water would be released to power generators and provide as much additional energy as needed. The Belgian government has already developed a design for the atoll but would need to rely on private industry for construction.



Belgium's energy-storing artificial island would be a marvel of engineering located nearly 3km off the coast of the North Sea. It would store energy from a nearby wind farm and also use hydro energy to generate even more power. This "energy atoll" is still far from reality, however, as it still requires further studies.

GLOBAL WIND POWER CAPACITY SEES RECORD GROWTH

► Wind farms had a record-setting year for growth in 2012 as they were responsible for adding 44.7GW for a total global capacity of 282.5GW. The United States added more than 13GW of capacity in 2012, whereas China, which had massive growth in previous years, saw its added capacity drop to 13.2GW. In terms of percentages, the European Union led the way with 37.5%, while China and the U.S. followed with 26.8% and 21.2%, respectively.





Target: App Attackers

How Malicious Users Set Their Aim On Apps

SECURING DESKTOP COMPUTERS IS A battle companies have fought for years. Increasingly, though, businesses are turning their attention to doing the same for mobile devices, including by addressing threats related to mobile apps. The following details how hackers use malicious apps and what companies can do about it.

STATE OF ADDRESS

Mobile device apps are a major security concern due to the threats they pose related to enterprise networks and because so many users download apps from application

stores, says Nitin Bhas, senior analyst with Juniper Research (www.juniperresearch.com). Some uncertified third-party apps are actually malware or spyware that retrieves email, messages, call history, client lists, and other data. Further, some unsecure mobile apps are marketed as business or personal apps but carry malware that can transform the device "into a gateway for Trojans and viruses to enter the enterprise network" or "cause data leakage or exposure," Bhas says. Other malicious apps, meanwhile, can locate and track the movements of devices and their users.

Attacks on mobile apps constitute "an area where we're all learning," says Monica Paolini, founder and president of Senza Fili Consulting (www.senzafileconsulting.com). "Unfortunately, that applies to hackers and hacktivists, too, so we should expect an escalation in security threats in the future." BYOD (bring your own device) programs, she says, make the learning process more complex, but "eventually, the enterprise cannot and will not revert back to approaches that restrict choice and functionality and may overall increase costs." Better network intelligence, she says, is the key to the learning process.

Key Points

Various forms of malicious apps include those that deliver payloads onto the user's device to retrieve data that the malware returns to the attacker.

... Data that malicious apps target include email, contacts, call histories, client lists, and geo-location data. Some apps also target corporate networks.

... Companies affected by attacks related to malicious apps stand to lose data, money, and reputation.

... Ultimately, employees play an essential role in guarding against malicious apps.

WHAT'S AT STAKE

"Attackers are primarily financially motivated," says Michela Menting, senior analyst, cyber security, with ABI Research (www.abiresearch.com). "They can make money through premium SMS fraud or by collecting mobile banking information." They also harvest data from devices and sell it on the digital black market, she says. "Personal data is a lucrative commodity that sells relatively well depending on the details collected," she says.

In general, companies stand to lose their data, money (tracking and data-wiping costs, fines, liabilities, etc.), and reputation (lost clients, customers, and commercial relationships). Bhas says such damage is one of the most underestimated risks that enterprises face, as unauthorized access to company data via mobile devices can "lead to billions of revenue loss."

Tim Shepherd, Canalsys (www.canalsys.com) senior analyst, says organizations have a clear responsibility to invest in security and device management solutions to prevent and handle such threats. According to Shepherd, "there are significant cost implications to dealing with the consequences of a successful attack, ranging from a potential need to replace hardware to a need to invest in PR where data loss, for example, has become public or known to customers."

For SMBs particularly, "reputation is critical," he says. Succumbing to a preventable cyber threat due to lax security "could be severely damaging," Shepherd adds.

HOW APP ATTACKERS ATTACK

One way a malware-infected mobile app attacks is by delivering a malicious payload that tracks, records, and transfers device-stored contacts, email, logins, passwords, browser



"They can make money through premium SMS fraud or by collecting mobile banking information."

Michela Menting

senior analyst, cyber security, ABI Research



"Many SMBs simply don't have a security policy for mobile apps/data access and don't recognize the value of information that's stored on their device."

Tim Shepherd

senior analyst, Canalsys

history, and geolocation data. "The most common malware are spyware and premium SMS fraud," Menting says. "However, there has been a rudimentary adaptation of more complex PC-based malware, such as phishing and spam threats." Mobile Web browser and QR code exploits can also deliver malicious payloads. Malicious apps typically become available

as free apps through third-party app stores that lack a thorough vetting practice or that serve as fronts for spreading malicious apps disguised as legitimate apps.

Paolini says third parties can also insert malware into legitimate

apps and then promote the modified versions. Granting permission to collect and transmit data from the device can subsequently lead to exposure and loss of privacy and data. Elsewhere, some malicious apps target enterprise networks to acquire corporate data. While a connection to the enterprise may be protected (via VPN, for example), Paolini says, the entry point of the attack (the device) is more difficult to secure. Also worrisome are

DoS (denial of service) and other attacks against the mobile network itself, she says.

Yet another attack type that has been mostly inactive to date but can be effectively executed on mobile devices and could have a major impact, Menting says, involves espionage, including by rival companies. "Specially written malware could activate the camera and microphone to record sensitive information or alternatively connect to the corporate Wi-Fi and then start snooping around the network looking for valuable information," she says.

WHAT TO DO

Companies, Shepherd says, should view employees generally the same as they do consumer app users. "They're effectively the same people, and the BYOD trend . . . ensures that there are few hard and fast differences in terms of their susceptibility to attack," he says. Though companies might place restrictions on device usage for work purposes, he says, most employees will download apps from consumer app stores, thus opening the device and company to potential risks.

"SMBs need to better understand their risk profiles. Many businesses

Mobile Web
browser and QR
code exploits can
also deliver mali-
cious payloads.

are still assessing what policy to adopt," Shepherd says. "Many SMBs simply don't have a security policy for mobile apps/data access and don't recognize the value of information that's stored on their device." Businesses of all sizes, Shepherd says, must become more open to implementing policy that enables employees to be productive while ensuring data is secured, and SMBs must recognize the reality of today's environment because they can't afford to ignore the threats.

In terms of tools, Menting says, implementing a mobile antivirus solution is a first step to thwarting malicious apps. Paolini says that although antivirus software is well-established among PC users, mobile subscribers don't actively take steps to protect their devices and data, possibly because security hasn't been a major issue in this area to date. "But this is bound to change as more sophisticated mobile devices are adopted, more data traffic is generated, more applications are developed and downloaded, and as mobile networks move to IP platforms from closer, more-difficult-to-penetrate legacy mobile networks," she says.

Elsewhere, Menting says, authentication solutions are also critical when using devices for business. "This can include using password or PIN protection, auto-lock features, two-step verification codes, or multi-token authenticators," she says. Additionally, privacy apps can protect against phishing websites and SMS attacks, but arguably the most important thing is using anti-theft, backup, and recovery tools that can enable geo-tracking of lost devices, remote locking, data wipe, and automatic backup on a remote server, she says.

Bhas recommends having all required devices audited, managed, configured, and protected to help ensure devices aren't jailbroken, unwanted or malicious apps are removed, and IT or administrators have visibility "in order to deliver more secure configurations and policies." Individually, enterprises must implement their own policies concerning access to data and data leakage, Bhas says.

Enterprises must also be aware of the various activities occurring on employees' mobile devices, including activities related to email,

file and document storage, and installed apps, Bhas says. The expectation is mobile device management platforms will be the umbrella under which security and management functions will fall, including policy management, strong authentication for se-

cur access, data protection, and device protection, Bhas says.

Ultimately, employees play an essential role in guarding against malicious apps. Menting says "they're the ones that will allow malware in, whether they realize it or not. By training users on correct security practices and making sure they understand the potential threats, SMBs can help minimize the risks." Incident response is equally important. "Breaches will occur, even to the most astute observer. It's therefore important that the employee knows the appropriate response procedure, as well. This will help contain what could otherwise be a highly damaging breach," Menting says.

Ultimately, employees play an essential role in guarding against malicious apps.



Some mobile apps can carry malware that transforms the device "into a gateway for Trojans and viruses to enter the enterprise network" or "cause data leakage or exposure."

Nitin Bhas

senior analyst, Juniper Research



Attacks on mobile apps constitute "an area where we're all learning," including for "hackers and hacktivists, too, so we should expect an escalation in security threats in the future."

Monica Paolini

founder and president, Senza Fili Consulting

PROACTIVE APPROACH

Long-term success of any secure mobile framework will depend heavily on its users, Shepherd says. As threats become more prevalent, employees will be forced to be more cautious when using mobile devices. Shepherd says a similar scenario will pattern that of desktop computer usage where early users weren't aware of security threats, while today's users are very familiar with the need for security software. Mobile device security will need a more proactive approach by businesses and employees, he says. ●



Wireless Choices Explained

Cellular vs. Wi-Fi

WIRELESS NETWORKS are all around no matter where you go. Your home probably has a wireless network and your office almost certainly does. Coffee shops and restaurants often provide free Wi-Fi to patrons, and cellular networks cover almost every inch of the world. But with so many different types of available networks, from multiple 802.11 Wi-Fi standards and frequencies to 3G and 4G LTE (Long Term Evolution) cellular, it can be difficult to keep up with the technological advances. We will explain the differences in speed and capabilities between cellular and

Wi-Fi networks, and we will take a look at what the future of wireless networking might look like.

CELLULAR vs. WI-FI

Both cellular and Wi-Fi networks are essential for businesses, but they serve different purposes in different contexts. Depending on the device, its proximity to a network, and other factors, Wi-Fi accommodates data transfer speeds as high as 450Mbps, while 4G LTE networks (which are relatively fast in the cellular world) deliver average data transfer speeds of only 20 to

25Mbps. However, cellular speeds can be particularly faster or slower depending on coverage area.

Of course, cellular networks can be used almost anywhere, while you can only connect to Wi-Fi networks if you're within a certain range. Wi-Fi data rates are only limited by available capacity, whereas cellular plans are often limited either by caps or by throttling when you go over a certain amount, which can lead to heavy overage fees if you're not careful.

It's clear, then, that Wi-Fi and cellular networks offer quite different things, but there is also variety among

Key Points.....

Wi-Fi and cellular networks are different from each other in terms of speeds and data caps, but there are also many different iterations of each network type to consider.

For smaller companies, a relatively simple wireless setup might cover all of the necessary bases.

Wi-Fi standards and frequencies significantly impact speed and performance, but networking devices' antennas and radios also play a part.

Wireless networks are already fast, but if emerging innovations are any indication, we've only scratched the surface of what might be possible in the near future.

network types. For instance, with 3G it's possible "you're looking at something like 5Mbps [downlink] and maybe a couple of megabits [uplink] because [it uses] shared bandwidth and is oversubscribed," says Mark Tauschek, lead research analyst with Info-Tech Research Group (www.info-tech.com). And if you move to 4G LTE, "you'll see 25 or 30Mbps down and up to 20Mbps up because the networks aren't saturated yet." But Tauschek expects those speeds to decrease as demand rises. Still, he says, the current generation has a theoretical maximum of 50Mbps and there is a version that "isn't widely deployed yet" that could hit 100Mbps.

On the Wi-Fi side, there are various standards and frequencies to contend with (which we'll discuss shortly), but one of the biggest factors that affects the performance of a Wi-Fi network is the wired connection behind it. "It often helps to think of water coming out of a pipe," says Charles Golvin, principal analyst with Forrester Research (www.forrester.com). "The rate at which the water flows is determined by the narrowest pipe in the entire flow where the water is originating. Currently, an 802.11n dual-band Wi-Fi connection is capable of transmitting and receiving data at more than 100Mbps, but if what's connected to the router is a 1.5 or 3Mbps DSL line, then that's the speed you're going to get from the Internet." This difference in technology doesn't even take into account the size of your company and the affect it can have on your Wi-Fi network.

NETWORK VARIATIONS

There are multiple Wi-Fi options available; what you choose will vary based on the physical size and structure of your offices. "If you're small office with just a few people and one or two rooms, you could probably get away with sticking one of these access points up there yourself, connecting an Ethernet cable to it, and feel reasonably confident that everybody in the one or two rooms will



"I think what's going to happen in the future is that the Wi-Fi hotspots that are available to the general population are going to split into two tiers of connections. One is going to be the best effort, fed by a relatively low-speed backhaul, and [the other will be] powered by fiber optics or other very high-speed connections that can deliver performance on par with (or in some cases superior to) what cellular networks provide. That's another evolution of what our Wi-Fi connections out in the world are going to become."

Charles Golvin

principal analyst, Forrester Research



"There's a new standard coming up called 802.11ac and we're actually already starting to see devices come out. The ratification is expected in September of this year from the IEEE. But the Wi-Fi Alliance, which is not really a regulatory body, but more [of] a standards association, is certifying 802.11ac this quarter. And as soon as they do that, you're going to start to see vendors coming out with 802.11ac access points."

Mark Tauschek

lead research analyst, Info-Tech Research

be able to access the network," says Golvin. In fact, you may be able to use a relatively simple wireless router with basic security measures in place and not worry about the more expensive networking alternatives that are used by larger enterprises.

If your company has "large offices and a lot of employees using Wi-Fi," Golvin recommends that you reach out to a professional designer who "knows something about the way that radio waves travel and the

types of objects through which they don't travel." Offices with quite a bit of space, dozens of individual rooms, and walls separating them will require more sophisticated equipment than simpler layouts. Larger enterprises also often require stricter security measures than some smaller organizations, which isn't necessarily possible with routers.

Golvin says that working with a third-party professional to help create a proper design and put the necessary

equipment in place will ensure that all of your employees will have good connections to a fast network.

NOT ALL WI-FI STANDARDS & FREQUENCIES ARE ALIKE

When it comes to implementing a fast network, you need to consider current wireless standards and which products use them. The IEEE (Institute of Electrical and Electronics Engineers) created the first 802.11 wireless standard, which supported data transfer speeds at or below 2Mbps, in the late 90s. Since then, other standards have come and gone (to varying degrees), but many networking devices are theoretically able to hit speeds of 450Mbps or more; “theoretical” is key here, though, as without special antennas and circumstances, lower speeds are more common. What’s more, data transfer speeds generally top out in the 150 to 200Mbps range for most Wi-Fi routers in real-world settings, with some rates significantly slower.

The standard that almost every current generation device supports is 802.11n. Because 802.11n devices are backward compatible, Tauschek says, there is still a “fair bit of 802.11g and 802.11a in use”; these earlier standards transfer data at speeds up to a theoretical maximum of 54Mbps. Tauschek says that most enterprise-class 802.11n access points will probably provide maximum data transfer rates between 200 and 250Mbps, which is roughly half the 450Mbps maximum claimed by some vendors. It’s true that the wired connection attached to your Wi-Fi access point has a major effect on your wireless network performance, but frequencies also play a part.

There are two common frequencies used with Wi-Fi. One is 2.4GHz, which Golvin says is the same frequency used for “Bluetooth, microwaves, some cordless phones, and other consumer devices” and “as a result, that frequency band can get quite congested and be subject to a lot of interference

from other devices.” The other frequency is 5GHz, which Golvin says “doesn’t propagate well,” meaning that it doesn’t have as much of a range as 2.4GHz alternatives, but “fewer devices use this standard, so the band is cleaner.” To boil it down, 802.11 standards tell you how fast your network could be, while frequencies can maximize or limit the range and connection reliability of the network.

DEVICE DIFFERENCES

In addition to 802.11 standards and different frequencies, the antennas and radios inside of networking devices also play a part in speed and overall performance. For instance, Tauschek says that some vendors are “really into antenna technology” and have actually created “antenna arrays that move around and are very intelligent.” Some companies are also embracing beamforming, which “does a better job at getting around obstacles and dealing with hidden nodes and cross-channel interference,” Tauschek says. These innovations could replace more standard devices that often have static antennas and can’t necessarily home in on a signal as well as newer alternatives.

When it comes to radios, Tauschek says that a typical Wi-Fi radio will operate at around 30 milliwatts and that “enterprise-class radios will go up to 100mW.” Still, he adds, many vendors are working on improving this technology and have some radios that can hit 200mW. And in theory, says Tauschek, “a higher powered radio is going to cover a bigger area.”

While antenna and radio considerations are important, there’s also the issue of matching a networking solution to the devices you want to use. “If you really want to get the absolute best performance out of a Wi-Fi connection, especially in your home where you as a consumer are responsible for matching up the access point or the router and your devices, then you want to make sure that the two of them are taking advantage of the

technology that each of them have to the best possible extent,” says Golvin. This sentiment also applies to the cellular side where you won’t get the full 4G or LTE experience unless you have a phone that supports the network. As laptops, tablets, and smartphones continue to evolve, you’ll need to make sure your network supports whatever wireless standard is required for the best possible performance.

MORE ON THE HORIZON

With LTE already in place with most wireless carriers, it’s not unreasonable to wonder what will come next in the cellular world. According to Golvin, the next stage of mobile networking will be LTE Advanced, which he says will go beyond current speeds of roughly 15 to 20Mbps and could even exceed 100Mbps. But he also points out that the potential performance of a cellular network is the amount of “regulated airwaves” or “licensed spectrum,” which give carriers control over the quality of the service they provide over the network.”

Not to be outdone by cellular innovation, Tauschek says, Wi-Fi technology will grow exponentially, as well. For instance, the new 802.11ac standard will be “ratified later this year,” says Tauschek, and could reach network speeds of an astonishing 7Gbps or higher. Even in a typical configuration, he says that companies could theoretically get speeds of 1.7Gbps, while realistically settling in the 800 to 900Mbps range, which is almost four times faster than current speeds. And the good news is that you won’t have to wait long. Tauschek says 802.11ac devices are already in the works and that the migration is going to happen “even more quickly” than the move from 802.11g to 802.11n.

With so many new technologies on the way and higher speeds than ever before, it’s safe to assume that networking will once again change the way we live and work in the very near future. ●



GPS Solutions

Benefits For Small Businesses

DEPENDING ON THE DIRECTIONS in which your business is growing, it's possible that an increasing number of your employees will hit the road to make and strengthen customer relationships, deliver new products, attend trade shows, and/or stage events to promote your company's brand. If you or any number of employees are traveling frequently, perhaps now is the time to invest in GPS systems. Although GPS navigation apps installed on smartphones can be helpful, it would serve you well to consider some of the features that dedicated GPS units bring to the table, such as tracking, reporting, real-time alerts, and hands-free calling. Let's take a look at some of the benefits GPS units can bring to a small business.

TALK HANDS-FREE WHILE A GPS DEVICE NAVIGATES

Using a cell phone while driving is not only dangerous, it is prohibited

in 10 states as well as Washington, D.C. Therefore, providing hands-free calling options for your employees may be one of the best forms of liability prevention your business can invest in, and certain GPS units can help in this area. GPS device manufacturers clearly understand the need for GPS features that assist drivers while allowing them to keep their hands on the wheel and their eyes on the road. To that end, some GPS units on the market today include speakerphone and Bluetooth functionality. These features work together with cell phones so that a user can, for example, use Bluetooth to pair a smartphone with a GPS unit, adjust the GPS unit's settings to accommodate hands-free calling, stow the phone in the glove box, and hit the road with the knowledge that placing and receiving phone calls can be done via voice alone. These GPS units typically

include POI (points of interest) dialing, too, which enables users to call ahead to a hotel, restaurant, or any other location appearing on the GPS unit's display.

STANDARDIZE GPS EQUIPMENT FLEET-WIDE

If your business relies on a fleet of vehicles to deliver products or provide services, whether the coverage area is city-wide or nationwide, the value of installing GPS solutions across the fleet can't be overstated. Deploying a unified network of GPS units enables administrators to send orders, routes, alerts, and other relevant information remotely. And by preprogramming customer maps, you can potentially let clients view where fleet vehicles are located in real-time. The same goes for recurring destinations, as tracking and fleet management specialists can determine

optimal routes employees should take in order to maintain a prompt schedule, meet quotas, or get other travel-related tasks done more efficiently. Solutions in this area range from complex third-party systems for large fleets to simple (sometimes mobile) fleet tracking apps that work for smaller businesses on a tight budget.

MANAGE FUEL USAGE WITH LIVE UPDATES

Experienced road warriors know that tracking down filling stations with the lowest fuel prices can turn into an endless chase, so it goes without saying that a GPS device that provides accurate local fuel price updates could cut down significantly on gas-up costs. GPS devices equipped with live data subscriptions can update listings for nearby gas prices based on the current or specified location, allowing you to compare prices in the vicinity or on an upcoming route. Some systems also include fuel logging features for keeping a record of gas consumption and purchases.

RECEIVE EARLY WARNINGS FOR TRAFFIC DELAYS

One of the most beneficial GPS features for employees, especially those traveling long distances or in high density areas, is the ability to automatically receive up-to-the-minute traffic data. Built into most GPS units, live traffic services deliver location- and route-specific information from traffic data suppliers. This data primarily comes from federal, state, and local departments of transportation; traffic helicopters; and data suppliers' own ground-level monitors and sensors. The result is that drivers are able to avoid problem areas and are less likely to get caught in congested traffic due to such things as construction and road or lane closures. And even when unexpected roadblocks such as auto accidents occur, drivers can use the alternative route feature common to most GPS devices to

quickly map a way around the roadblock or problem area.

PAIR MOBILE APPS WITH GPS SYSTEMS

Just as mobile apps can't replace dedicated GPS units, neither can the typical GPS unit replace all of the functionality available in location-based apps for smartphones and tablets. In fact, with a combination of the two at hand, you can consider the GPS unit your captain and a carefully chosen collection of location-based apps your co-pilot. For example, let your in-vehicle GPS device lead you to a good parking spot, and then use a city transit app to help you find the right train for your lunch meeting. Select manufacturers have even taken dual-device navigation to the next level by developing apps that sync with your GPS system. Such apps are capable of saving your frequented locations, parking spots, and various services associated with your wireless carrier's data plan.

CONSIDER DIFFERENT GPS MOUNTING OPTIONS

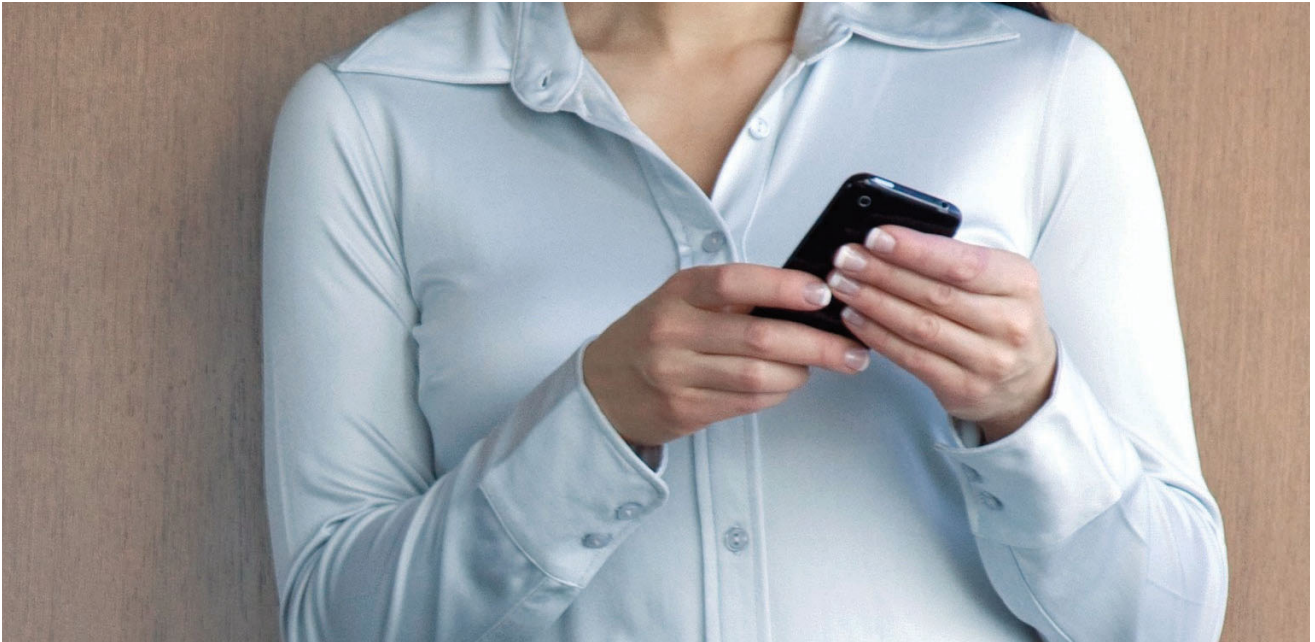
Brand-new GPS devices almost always come with mounting accessories in the box. You may find that these factory accessories work quite well, but they might not automatically be the best options for your particular vehicles or drivers. Investigate various alternative mounting options, as some have evolved beyond the standard plastic windshield attachment. For instance, some of the more advanced GPS mounting systems feature a partially embedded magnetic mount that charges the system when it's docked. Whatever style of mount you consider—whether it clips to an air vent or cup holder, rests in a weight on the dash, or extends with a gooseneck from a suction cup or cigarette lighter—think of it as a worthwhile investment if it helps your employees stay focused on getting from point A to point B with the least amount of hassles and distractions.

TRACK TRIP METRICS & DRIVER ASSIGNMENTS

If your business utilizes a company-wide GPS vehicle tracking system, administrators can monitor travel progress as drivers track their trip statistics from fleet GPS devices. While on the road, drivers can observe their vehicle's current speed, established speed limits, estimated arrival times, odometer reading, and time to destination on a unified dashboard. To prepare recorded data for post-trip reports, some systems let you export mileage information or use a built-in mileage calculator to determine if the trip was profitable. These features may serve to increase travel efficiency in future trips. Fleet vehicles might also require more comprehensive monitoring history; therefore, a system that offers automated reporting can be invaluable. Tracking reports might include activity details, full day start and stop times, idle time, path history, vehicle performance, maintenance reminders or stops, speed summaries, summary notes, or additional relevant data. Fleet managers can also distribute assignments via Web alerts, key fob, in-vehicle reader, or text message.

USE GPS SYSTEMS DESIGNED FOR COMMERCIAL VEHICLES

Whether the fleet you manage consists of a small number of vehicles or hundreds of trucks, there is always plenty of travel data worth gathering. Consumer GPS devices are capable of collecting certain relevant metrics, of course, but some companies may benefit from high-end commercial GPS solutions. These systems may feature keypads, touchscreens, multiple USB ports, Ethernet ports, expanded operating system or software functionality, and built-in memory. In addition, durable commercial models are designed to weather harsh temperatures, humidity, vibration, and shocks more readily than retail-box consumer GPS devices. ●



Bluetooth & NFC

Two Wireless Technologies, Many Different Uses

ALTHOUGH THEY MAY seem alike in many ways, the only noteworthy similarity between Bluetooth and NFC (Near Field Communication) technologies is that they are both wireless in nature. Aside from that, each technology is best suited for specific applications that leverage their inherent strengths. For instance, Bluetooth is perfect for lengthy interactions where two or more devices are connected for a long period of time.

By contrast, NFC is a fit when only short connections are required. The key to truly understanding the difference between these two technologies and how they can be helpful in a variety of ways is to take a look at their potential uses and determine whether or not a certain feature is beneficial to you.

BLUETOOTH USES

Bluetooth has been around longer than NFC and has undergone many

changes over the years. Initially its primary use was to pair a mobile phone with a wireless headset, and that usage has grown to include the pairing of computers and even game consoles. Business travelers are familiar with Bluetooth because it is used for the aforementioned wireless headsets as well as for hands-free calling in certain situations. And as the technology continues to evolve, more and more uses emerge.

Bluetooth is also showing up on different types of consumer devices. Some digital cameras have Bluetooth built-in so you can instantly send a photo to a smartphone or to your computer without having to plug in a cable. And

some televisions, Blu-ray Disc players, and other devices let you use your phone as a remote control. As we mentioned, Bluetooth is a better fit for long-standing connections and with each new generation, the technology is becoming much more reliable and suitable for a variety of new applications.



Bluetooth has been around longer than NFC and has undergone many changes over the years.



NFC USES

Whereas Bluetooth is more commonly used for long-term connections, NFC is more often used for fast data transfers and other quick share situations. NFC enables you to either touch two NFC-capable devices together or bring them into close proximity with each other to share photos, videos, and other files almost instantly.

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NFC enables you to either touch two NFC-capable devices together or bring them into close proximity with each other to share photos, videos, and other files almost instantly. But the technology goes way beyond sharing multimedia and could revolutionize the way people use their phones in everyday situations.



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You may have seen advertisements for applications where you can use your phone to pay for items at gas stations, department stores, and other locations. These types of instant payments use NFC technology to turn your smartphone or other device into a mobile wallet. You can, for instance, store credit card information on your smartphone and swipe your phone past a terminal to pay for products or services. Additionally, with many of these applications, you can keep receipts and other information stored on your smartphone or tablet or send them via email, which can be a perfect solution for frequent business travelers as well as anyone interested in going paperless.

NFC can also be used as an identification tool, similar to the keycard you might use to gain entry to a secure room or building. But perhaps one of the most intriguing uses of NFC for companies could be interacting with customers at trade shows or other events via NFC-enabled devices.

Imagine being able to have potential customers swipe their phone next to a terminal and choose to instantly share their contact information, helping you build a stronger database. You could also use such terminals to share advertisements, product facts, coupon codes, and other information that could help drive sales of your products in stores.

NFC remains a relatively new technology and many companies are still

sorting out how to apply it to traditional business practices. But as you can see, NFC holds significant potential and is already showing how it can make sales situations essentially stress-free for the customer.

USING THEM TOGETHER

In some situations, NFC technology can actually improve Bluetooth functionality. For instance, some companies use NFC connections to help set up Bluetooth connections quickly. Instead of searching for a Bluetooth connection or holding down a button for a long period of time, you can initiate an

NFC connection with little effort and pair devices almost instantly.

It isn't clear whether NFC will eventually replace Bluetooth altogether, but for now each technology clearly has its own benefits for users to take advantage of. For long-term device pairing, Bluetooth is the way to go. For instant data transfers, NFC is easy and convenient. And because newer smartphones are starting to come with these technologies built-in, companies and consumers won't have to choose between them, but instead be able to take advantage of every benefit that both Bluetooth and NFC have to offer. ●

➤➤ NFC-Based Payments On The Rise

According to a report from the Pew Research Center and Elon University, 65% of the 1,021 "technology stakeholders and critics" surveyed agree that mobile wallet usage will become "commonplace by 2020."

We are already at the point where debit cards, credit cards, and

other forms of payment are used much more often than cash, but this report says that in less than eight years, NFC-based mobile payments may even outpace those alternatives or replace them altogether.

There are still a few hurdles to overcome with NFC related to

potential security issues and the reluctance of some users to go fully digital. But if you, as a consumer or as a business executive, aren't looking into the many possibilities of NFC, you might want to start, because it appears that NFC is here to stay.

➤➤ NFC Technology For Mobile Payments Becomes Standard

According to a 2012 Juniper Research report, the NFC global retail payments market will grow more than 700% over five years, topping \$180 billion by 2017. However, the report also acknowledged

reluctance among some retailers to switch from recently adopted technologies and plastic cards to NFC. "This is a critical time for the NFC retail payments market," said report co-author Dr. Windsor Holden.

"Despite the significant progress being made today, the full potential of the market can only be fulfilled if all ecosystem players are equally committed and mobile wallet consortia remain in place."



Tablets For Business

Top Features To Consider

PERHAPS THE TABLET COMPUTERS your employees are using are starting to show signs of age. Or maybe you're intrigued by the possibility of buying tablets for your employees for the first time. You're not alone, as businesses of all sizes are increasingly finding that tablets are worthy alternatives to laptops in certain situations, or worthwhile second devices for salespeople and mobile workers in general. However, we won't try to convince you of the benefits of tablets here; rather, we'll run through the features you should consider if you're looking for new or updated tablets in today's market.

PRICE

If email and a modicum of productivity power are in order, you can get away with using tablets that retail in the \$300 to \$400 range. But if you want versatility, consider \$500 as your bare minimum and be prepared to pay \$600 or more per device. If low cost is of primary concern, know that you tend to get what you pay for with tablets these days, so if you're expecting a lot from a low-end tablet, you might be better off investing in newer smartphones. Operating system has a great deal to do with price, so read the next section for relevant cost information.

OPERATING SYSTEM

There are three major operating system players in the tablet game: Apple's iOS, Google's Android, and Microsoft's Windows 8. Because Android is an open platform, tablets running Android cost less (usually in the \$300 to \$400 neighborhood) than those running iOS (\$329 to \$929) or Windows 8 (typically \$500 or more). Windows tablets most closely resemble full-sized computers in their ability to run a variety of standard programs, including business staples such as Microsoft Office; this, combined with computing power, are what drive these devices to command



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higher prices. If you are considering an iOS or Android device, thoroughly investigate the corresponding app stores and the tablets' hardware capabilities to make sure the range of apps and tablet power will meet your needs.

PROCESSOR

The higher the processor's clock speed, the better; keep in mind, though, that most tablets have clock speeds slower than 2GHz. It's tempting to sum up a processor's power based solely on clock speed, but also consider the number of cores (dual-core is common now, and quad-core is becoming more so), the cache (if indicated, 1MB is fine but more is better), and graphics processor capabilities (which are important mainly if your employees work with high-resolution images and video). A lesser processor may work fine for an Android tablet, but more powerful components overall are required to capably run Windows 8.

MEMORY

When discussing mobile devices, some users and vendors use "memory" and "storage" interchangeably depending on the context, but these are two separate things. As with RAM (random-access memory) in a full-sized computer, the memory in a tablet determines how much data the device can juggle (or keep at the ready) at once, so more is better, especially for more intensive applications and multitasking. Consider 1GB a doable minimum, but 2GB or 3GB offer better performance and tablets with 4GB memory are increasingly available. As with processing power, more memory is particularly essential for tablets running Windows 8.

STORAGE

Tablet pricing is often tied in part to storage capacity, or the amount of space available to hold apps and all manner of files. Most tablets use

flash memory, with capacities generally ranging from 16GB to 64GB. Note that there is sometimes a significant difference between the capacity a tablet is listed as having and the capacity that is truly available to the user, which is due to the amount of space required by the OS and system files, so include this in your research before deciding what capacity is appropriate for your workers.

DISPLAY, SIZE & WEIGHT

We combine these three characteristics because a tablet's display size is directly connected to a tablet's overall size. Check system specs and user reviews to make sure the screen is durable, offers precise multitouch control, provides good imaging in bright light and other circumstances, and is not overly susceptible to glare or smudging. Also consider whether high definition and wide viewing angles are important. Otherwise, simply choose based on the size that's most appropriate for those using the tablets. On average, tablets have 10-inch screens (measured diagonally), with other sizes ranging roughly from 7 to 12 inches. Most weigh between 1.25 and 2.5 lbs.

WIRELESS

Tablets overwhelmingly come with integrated Wi-Fi radios; fewer offer cellular connectivity, Bluetooth, and/or GPS. Look for Wi-Fi that supports the 802.11a/b/g/n standards; 802.11n is newest and delivers the best functionality. At first glance Bluetooth may not seem necessary, but before dismissing it as a determining factor in your purchase, find

out whether users may need to use Bluetooth accessories such as headsets or keyboards.

BATTERY LIFE

As with display size, it's easy to take note of the advertised maximum battery life and not look any deeper, but it's worthwhile to read some user reviews for real world examinations of a tablet battery's life per charge. Also keep in mind that usage determines battery life, so although an advertised 12-hour battery life sounds great, it might not take into consideration heavy wireless, video, or graphics usage. Most tablets use a lithium polymer battery that, depending on overall device hardware and usage, will last between 4 and 18 hours per charge.

PORTS & EXTRAS

Tablets are notoriously light on ports, so make sure the tablets you buy have the quantity and type of ports necessary for your employees. Standard 3.5mm headphone jacks are common, as are HDMI and USB, but keep in mind that these aren't all the same; there is HDMI vs. Micro HDMI, for example, as well as Micro USB vs. full-sized USB, and older USB standards vs. the newer USB 3.0. In fact, there are far more port differences than these. Tablet extras to consider include built-in speakers and microphones (most have these), cameras (many have them, but they vary in functionality and quality; choose carefully if videoconferencing is important), security features (such as biometrics and face detection), and detachable keyboards. ●

As with display size, it's easy to take note of the advertised maximum battery life and not look any deeper, but it's worthwhile to read some user reviews for real world examinations of a tablet battery's life per charge.





SMBs & Cloud Backups

Assess Need, Compare Vendors & Select A Service

ALL COMPANIES UNDERSTAND the importance of backing up data, but they may not all be aware of cloud-based offerings that can save internal resources and lower the IT budget related to data storage. And some companies shy away from the cloud because they prefer familiar and traditional backup approaches or are fearful about the cloud's complexity and risk. Whatever the reason, there are benefits to consider.

CLOUD BACKUP ADVANTAGES & DISADVANTAGES

A chief benefit of cloud-based backups is that they don't consume onsite

resources and instead are housed off-site. According to Rachel Dines, senior analyst with Forrester Research (www.forrester.com), with PC-based backups, vendors introduce new features all the time. Generally, backups are non-disruptive, continuous, and provide the ability to work with open files even as they are being backed up. She points out that these backups can sometimes be accessed from smartphones and tablets, even if the data was originally backed up on a desktop or laptop.

Ileana Funez, research analyst with Info-Tech Research Group (www.infotech.com), says that on the server side, where

companies are backing up a larger amount of data from multiple systems, one benefit is that there is "very little management overhead that goes into it." Many vendors also offer redundant storage features and provide "a good amount of security for the long-term availability of data," she says.

However, there are a few drawbacks with cloud-based backups that you should be aware of. For one, you are putting potentially sensitive data in the hands of a third-party source and if you aren't fully aware of their security practices, you could be putting that information at risk.

Key Points.....

Compare as many vendors as you can, look at the feature sets of their services, and compare the pros and cons of cloud-based backups.

Keep disaster recovery and business continuity concerns in mind when selecting a cloud-based backup service.

Gain an understanding of the types of data that should be backed up and set up a schedule that won't disrupt employee productivity.

Consider complementing your traditional backup approach with cloud-based backups to create a hybrid solution that covers all bases.

Pricing can also be an issue because it “is based on capacity and the one thing companies really have to look out for is overage fees,” says Funez. If you sign up for a certain capacity and then exceed that limit, you could be hit hard by additional charges that negate any potential savings. But most of these problems can be overcome by due diligence up front and understanding what exactly it is you’re paying for.

WHAT TO LOOK FOR IN VENDORS & SERVICES

When comparing cloud storage vendors, you need to know the features they offer, but also whether or not a vendor is a fit for your backup needs.

“From a technology perspective, you want to know what they are going to do to help with data reduction and bandwidth efficiency,” says Dines. “You want to make sure that the backups aren’t going to take a really long time and stall up your systems and that you aren’t going to be paying high network costs because the backups are really large.”

Next to the technology itself, you also need to be aware of the vendor’s security practices, find out what types of data loss prevention solutions they have in place, and also learn about their data retention policies. “How long is data kept?” says Dines. “Can that be customized for the particular needs of my organization? Can I choose between a 30-, 60-, 90-day retention? Those are the basics that you want to look for.”

DISASTER RECOVERY & BUSINESS CONTINUITY CONSIDERATIONS

Another huge benefit of cloud-based backup, and something that every company needs to know about before making the plunge, is that these types of online services are perfect for disaster recovery and business continuity.

“We’re starting to see some of the online backup providers also offer cloud disaster recovery,” says Dines. “You’re backing up to them and if you lost your primary data center, you



“Businesses that will get the most value out of online backup are those with low storage needs or low data transfer flows. Companies do need to compare it to traditional in-house backup options as well, because if they have a lot of data, the cost savings may not be there.”

Ileana Funez

research analyst, Info-Tech Research Group



“Any time you talk about online or cloud services, you need to vet their security practices. What are they doing from a data loss prevention and data segregation standpoint? What levels of encryption do they use?”

Rachel Dines

senior analyst, Forrester Research

could recover in the cloud using your backups to their data center.”

However, Dines warns that you can’t abandon having a disaster recovery plan just because you have backups stored off-site. “You still have to have a way to recover that data and those systems to alternative hardware and an alternate location,” she says. That’s why it’s important to maintain great communication with your vendor from beginning to end and ensure that you will be covered in case of a data loss event.

BACKUP CONSIDERATIONS

In terms of what should be backed up, Funez and Dines have slightly different views. Funez says companies should mainly focus on backing up data that is “difficult to replace,” such as ERP, CRM, and email data, as well as financial databases and HR systems. Dines agrees that it’s important to back up mission-critical data, but that you also need to back up everything else. That may seem unreasonable and potentially expensive, she says, but companies can’t counteract that notion by minimizing data retention.

“If you can get retention times down to 30 days or less, that’s going to save

you a significant amount of money,” says Dines. “The majority of backups need to be restored from the past couple of days, not from a month ago. The likelihood that you’ll need a backup from even 30 days, 60 days, or 90 days is pretty low. To save on costs, you can cut those retention times down.”

TAKE A HYBRID APPROACH

If you’re still not sure whether or not a cloud-based backup approach is right for you, consider dipping your toe in the water instead of diving in head first. Dines says that small organizations have the possibility of using the cloud as their sole backup solutions, but that “as you get into larger companies and larger amounts of data, it’s very useful to have a local stop.”

Funez agrees, saying that you should always have an on-site backup solution in place for your mission-critical data, but that you can use cloud-based backups for emergencies. She does say that companies that use remote location should consider backing up directly to the cloud, but for many companies, a hybrid approach is a great way to start using the cloud without fully committing to it. ●



Smartphone Tips

Nuts & Bolts Advice

WINDOWS PHONE

FIND WORDS ON WEB PAGES

► Being able to speed your browsing on your smartphone is important; that's why Windows Phone devices have the same Find function you find in Internet Explorer integrated into the smartphone's mobile Web browser. To access the function, just navigate to a Web page, tap the ellipses in the lower-right corner of the screen, tap Find On Page, and then just type the keyword you're looking for. Now, just tap the right- and left-facing arrows to scroll through the instances of the word for which you're looking.

DELETE EMAIL IN BULK

► To quickly delete a single email, on Start tap an email account that has the unwanted email(s), tap the email you want to delete, and then tap Delete. To trash multiple emails simultaneously, tap to the left of the email author to display a row of checkboxes beside each email. Next, tap the checkboxes that correspond to each email you want to delete and then tap the Delete (trash can) icon to complete the operation.

CLEAR BROWSER SEARCH HISTORY

► There are many reasons to delete the search history from your Windows Phone 7 smartphone. They can range from protecting corporate secrets to hiding the embarrassing results of a seemingly innocuous search phrase. No matter the reason, deleting search history is a snap. Bring up Settings, then tap Applications, Search. Tap the Delete History button, and the evidence will be history.

STOP LOADING MOBILE VERSIONS

► A common mobile browsing pet peeve is being forced to accept mobile versions of websites. But even after you make your "full Web version" selection, many websites continue to force the sometimes difficult-to-navigate mobile versions of their sites on you. You can stop the insanity by selecting Settings, Applications, and Internet Explorer. Tap to change from Mobile to Standard browser.

ANDROID

Android phones have a built-in capability to serve as storage devices. You can drag files between your PC and your phone . . .

USE YOUR PHONE AS A USB STORAGE DEVICE

► Android phones have a built-in capability to serve as storage devices. You can drag files between your PC and your phone, which makes loading up your phone with music, photos, and other documents an easy process. But before you can start transferring files, you need to turn on the USB storage mode on your Android phone. The process can vary slightly, but these instructions should be general enough to work for most models.

Connect your smartphone to your PC with a USB cable or adapter. Power up your phone and slide the notification drawer down. Tap “USB connected: Select to copy files.” Select “Turn On USB Storage” and then tap OK.

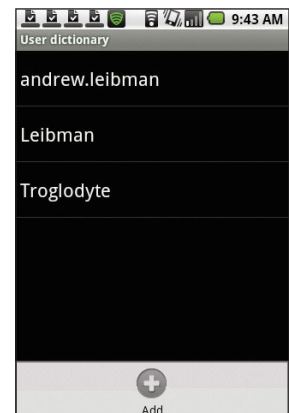
If an AutoPlay dialog box opens on your PC, click the option to open the folder or device. If the AutoPlay dialog box doesn’t open on your PC, select Start, Computer, and locate your smartphone in the list of devices attached to your PC. Double-click the smartphone device to access the phone’s list of storage locations. Drag and drop the desired files between your PC and your phone. When you’re finished, press Stop on the phone to turn off USB storage mode.

ADD & REMOVE DICTIONARY ENTRIES

► Typing on a smartphone is awkward at best, so we’re fans of anything that can speed up the process. The default Android keyboard application has an auto-complete function and User Dictionary that lets you add words to it that appear as you type. Tapping the word above the keyboard puts it into the text box, shaving precious seconds off your emails, text messages, and other mobile missives. It works great for generic words and phrases, but falls flat when typing unique items such as full names, email addresses, and unusual words you find yourself typing frequently. By manually adding such information, your Android device can display them as auto-complete options. If you use an older version of Android (version 2.1 or earlier), you may need to enable Auto-Complete before you can start building your User Dictionary. On these older devices, press the Menu key; tap Settings, Locale & Text, and Android Keyboard; and then click the checkbox beside Auto-Complete. Android 2.2 and newer devices have Auto-Complete automatically enabled, and you can start editing the User Dictionary right away.

To add a word to the User Dictionary in Android 2.1 and earlier devices, access the Locale & Text menu, scroll to and tap User Dictionary, press the Menu key, select Add, type a word (such as your last name), and then tap Add. To do this in Android 2.2 and later devices, access the Language & Keyboard menu, tap User Dictionary, press the Menu button, tap Add, type a word, and then tap Add to complete the operation. We recommend creating User Dictionary entries for your first name, last name, first and last name together, and “@gmail.com” or any other frequently used domains. The next time you attempt to type any of the words from your User Dictionary, the full word or phrase will appear among the other Auto-Complete options.

Some third-party keyboards also have a predictive text component that attempts to learn words you type frequently and suggest them as you type. For these, simply tapping a word from the list of suggestions is enough to add it to the User Dictionary; in this case, you may have dozens of words in your User Dictionary that you rarely use but that get frequently suggested. You can trim these by accessing the User Dictionary as described above, tapping a word you want to remove, and then tapping Delete.



Adding words to the Dictionary is easy, but it can get bogged down with useless entries.

BLACKBERRY

CHECK YOUR MEMORY

► If you don't have at least 12MB free then your BlackBerry might begin purging old messages to remain functional. If you regularly install apps, push that to about 20MB and note the file size of the apps before you commit to downloading them to maintain that limit. To check your device's remaining free memory on devices running BlackBerry OS 5 or earlier OS versions, access Settings from the Home screen, select Options, and then select Status. For BlackBerry OS 6-based devices, open the apps tray, select Options, Device, Device And Status Information, and then select Device Information. Alternately, you can press and hold the ALT, Shift, and *H* keys. View the File Free or Free Memory status, measured in bytes. Mentally add commas to determine how many million bytes are free; this is equal to the number of megabytes available.

SAVE POWER OVERNIGHT

► If you use your BlackBerry primarily for work purposes, it's a good idea to set your BlackBerry to shut off overnight and restart automatically the next morning. To do this, scroll to and select Options from the Home screen, Auto On/Off, enable the Weekday and/or Weekend options, and then set a schedule under the appropriate heading.

... it's a good idea to set your BlackBerry to shut off overnight and restart automatically ...

HELP ME!

► If you've ever had to talk with a customer support technician about your BlackBerry, whether it was someone from RIM or someone from your service provider, then you know that some of the first questions, besides the obligatory, "Did you turn the phone off and back on?" are about the model of your phone and the version of the OS you're running.

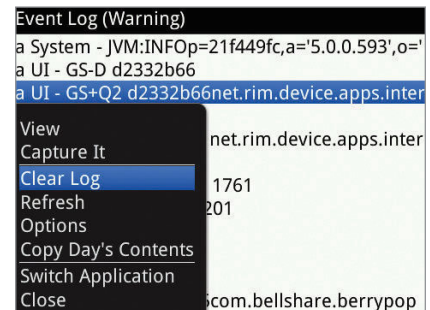
There are various ways to call up this information, but one of the best and easiest is the Help Me! screen. The Help Me! screen displays all kinds of information about the phone, including uptime, signal strength, battery level, app version, and platform. Even better, getting to the Help Me! Screen is simple; just press the left SHIFT key, the ALT key, and the *H* key, in that sequence.

CLEAR THE EVENT LOG

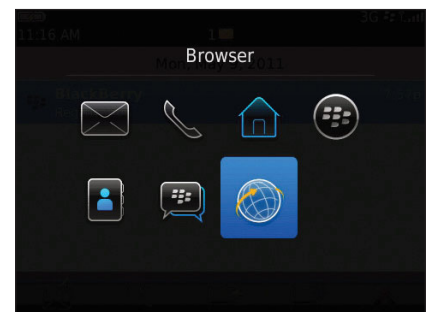
► Almost every action you perform on your BlackBerry is made note of in the Event Log, and it can begin to occupy precious phone memory, so it's a good idea to clean it out occasionally. This operation is the same for both BlackBerry OS 5 and 6-based devices. Just press the ALT key and type **lglg**. This will bring up the Event Log, which may look like a collection of unintelligible text entries. Press the Menu key, and then select Clear Log.

MULTITASK ON CALLS

► When you're on a call but using your Bluetooth headset, you can still use your BlackBerry to perform other tasks without disconnecting. For instance, to surf the Web while on hold, just press the ALT and Escape keys simultaneously to bring up an apps menu, scroll to the right to highlight the Browser icon, and then press the trackball/pad to launch it. Then just browse away. If selecting an app does seemingly end the call, just press the Send key to resume the conversation. This is also a great way to look up contacts, get directions, and send emails at the behest of your caller. Applications you can access using this menu include Google Maps, Messages, and even the Home Screen to tap into everything else.



Cleaning up your BlackBerry can improve its response time.



Multitasking while on a call is easy with a BlackBerry.

iOS

PDFS & IBOOKS

► Reading PDFs on an iPhone or other iOS device is pretty straightforward. Most of the time, you can easily add PDFs to your iPhone by attaching them to email messages you send to yourself. When you open the email on your iOS device, the email app opens the PDF. All you have to do is sit back and read the document.

But while mailing PDFs is a great way to get them to your iPhone, it's not the best way to read them or, for that matter, store them. The next time you need to read a PDF on an iOS device, try this trick. Send the PDF as a mail attachment, as you've always done, but when you're ready to read it, tap the Open In icon, located in the top right corner, and then tap Open In iBooks. iBooks is a great PDF reader and storage system. It will store your PDFs on the iBooks shelf, and let you take advantage of iBooks features, such as searching, highlighting or underlining text, and bookmarking pages.

In addition, because your PDF is now stored on the iBooks shelf, you can sync the PDF as part of your iBooks collection, ensuring that you have a copy of it on all of your iOS devices.

If you want to curtail the iPhone's ability to track your movements, you can simply turn off location services.



If you select Open In iBooks when you want to read a PDF on your iPhone, the app will store the PDF on your iBooks shelf.

MANAGE LOCATION SERVICES FOR SECURITY

► Your iPhone is happy to keep tabs on you, remembering your location at all times. Location services are useful for many reasons, including using the Maps app to find out where you are and how to get to where you want to go. Location services can also bail you out when you realize you've misplaced your iPhone, and you need to figure out where you left it.

But location services have a dark side. Having a device keep track of our location is a security concern for many of us. And don't forget that the phone uses Wi-Fi, GPS, and cell towers to pinpoint your location; that's a lot of drag on your battery just to help you find the nearest pizzeria.

If you want to curtail the iPhone's ability to track your movements, you can simply turn off location services. This will also boost your battery's run time. Tap Settings, Location Services. Tap the On/Off button to toggle the service to Off.

There is another, perhaps better alternative to managing location services than turning the feature off entirely. You can control which apps are allowed to use the service instead. This may not save much in the way of battery life, but it does let you get a handle on the security side of the issue.

Tap Settings, Location Services. Just below the Location Services On/Off switch, you will see a list of apps that can use location services. Each app will have its own On/Off toggle switch that controls the app's access rights to location services. Tap the toggle switch to enable or disable the ability of an app to use location services.

For the extra-security conscious among us, you can also control what system functions can use location services. Tap Settings, Location Services, System Services. Just like the apps list, you will see a list of system services that use location services. Toggle off any services that you don't want to access your location information.

Digital Cameras & Camcorders

A Feature-By-Feature Guide

THE BEST CAMERA OR CAMCORDER for you depends entirely on how you plan to use it, and often it boils down to whether you value versatility or portability. In this article, we'll explain what to look for when shopping.

TYPES OF CAMERAS

► The biggest, heaviest cameras are DSLR (digital single-lens reflex) models that use a mirror and a prism to let you look through the optical viewfinder and see exactly what image is coming through the lens. DSLRs accept a variety of lenses, which makes them versatile but adds to their expense. DSLR cameras also vary in size, from the larger full-frame models with the largest sensors (more on that later) to small models with smaller sensors. There are also newer mirrorless designs (sometimes called Four Thirds models) that dispense with the mirror and prism (and often the optical viewfinder) to substantially decrease size and weight, but they are slow to focus relative to their larger cousins. Compact point-and-shoot cameras have improved in quality dramatically throughout the years, but have tiny sensors, focus relatively slowly, and don't have as many accessories compared to DSLRs. They also lack swappable lenses. You must weigh these disadvantages against the convenience of portability.

RESOLUTION & SENSOR SIZE

► Although many manufacturers tout the MP (megapixel) rating of a camera or camcorder, MP is one of the most irrelevant specifications. It tells you only the number of pixels (picture elements) the sensor can capture, but nothing about more important features of the sensor (such as physical size) that contribute to image quality.

Getting great pictures is all about capturing as much light as possible, and a smaller sensor with a high MP rating will always capture less light than a larger sensor with a smaller MP rating. Larger sensors also allow for less noise (the little speckles of color that plague shots from small sensors), and a shallower depth of field. Depth of field control is what lets photographers do things like put someone's face in sharp focus while blurring the background.

APERTURE

 Aperture is the hole in the lens that lets light through. The bigger the hole, the more light, and the more angles through which light can enter. On cameras this is measured in focal length, or f-numbers (f/1.8, for example), where lower numbers represent a larger hole (for instance, f/2 is significantly larger than f/4). Lenses with lower f-numbers are better for shooting in low light, and for controlling depth of field.

OPTICAL VIEWFINDERS

 The optical viewfinder is the eyepiece you look through to frame a shot. Photographers are increasingly forced to rely on the large displays (digital viewfinders) on the back of the camera to frame their shots, which wash out in bright light and don't provide the color range or clarity of an optical viewfinder.

IMAGE STABILIZATION

► Unless you plan to shoot with a monopod or tripod, image stabilization is a key feature. This technology reduces or eliminates the small motions inside the camera or camcorder, where images are recorded. The best form of this is optical image stabilization, where lens elements move opposite to the motion to cancel it out. Many camcorders offer a much less expensive version called digital image stabilization. The image is zoomed slightly, and a program in the camera then does all the work of making sure the center portion of the frame remains stable even though the camcorder body is shaking.

ZOOM

► If you're buying a camera with interchangeable lenses, you can get anything from a fixed "prime" lens with no zoom to a massive telephoto with a tremendous range. Cameras with integrated lenses vary wildly in their zoom abilities, ranging from 3x all the way up to 30x and beyond. When comparing zoom levels, don't look at the "x" number, but instead use the "35mm equivalent" ratings: Lower numbers are better when you want a lens that can shoot wide or panoramic shots, and higher numbers are better when you need something that can shoot extremely distant subjects. For example, a superzoom with a 24-720mm 35mm-equivalent lens can back off for a wide shot or zoom up to 30x. Be aware that higher zoom levels decrease the amount of light that is let in and magnify camera shake, making it important to use image stabilization or a monopod/tripod.

FOCUS

► Nearly all cameras and camcorders sold today have autofocus, but if you want total control look for a model that allows for manual override. Focus modes that can lock in on a subject and adjust as the subject moves are important if you plan to take action shots.

If you use a camera with interchangeable lenses, note that not all of them have their own autofocus motors, and all of them will autofocus a bit differently. The sharpest lens on the planet is worthless if you can't focus with it, so test them out at the store whenever possible before buying.



CONTROLS

► Many consumer-level cameras favor ease of use over too many controls, but that isn't always a good thing. Ideally, you want a full manual mode with separate controls for ISO, shutter speed, and aperture. ISO adjusts how sensitive the camera sensor is to light; higher numbers make it more sensitive but also contribute to image noise. Shutter speed adjusts how long light is let into the camera; higher speeds are needed to freeze fast action, and lower speeds are useful in dim lighting. Aperture adjusts the size of the hole that lets light in. Adjusting these elements lets you capture images in all types of lighting and timing conditions.

Not all cameras come with full manual modes, but most come with aperture-priority and shutter-priority modes. Aperture-priority lets you select the aperture and then the camera decides an appropriate shutter speed for a proper exposure. Alternatively, shutter-priority mode lets you choose how long to leave the shutter open, and the camera decides how big to make the aperture for proper exposure. Knowing the right mode to use in different shooting situations makes a big difference with quality.

VIDEO CAPABILITIES



Any camera or camcorder you buy should have 720p video capability, minimum; 1080p is preferred as that is the native resolution of most HDTVs. Some cameras and camcorders let you take still images while you record video.

MICROPHONES



Most cameras and camcorders come with stereo microphones, but often the quality is mediocre and there isn't a lot of stereo separation. They also tend to pick up wind and internal motor noise. For best quality, invest in an external microphone.

OUTPUT



Most computers and some TVs have memory card readers that can pull files off the camera's memory card. Most cameras also have USB (Universal Serial Bus) or HDMI (High Definition Multimedia Interface) ports that let you transfer images to a PC or TV via the proper cable.

DON'T FORGET THE EXTRAS

► Necessary accessories and extra features are often overlooked when shopping. If you need to shoot underwater, for example, is a waterproof housing available? Do you need an integrated GPS to geo-tag shots so you know where they were taken? Do you need lenses and bodies that are rugged for demanding outdoor shoots? A Steadicam attachment for your camcorder? Multiple external flashes to do complex lighting for real estate shots? Make sure everything you need is available before you make an expensive mistake. ●

DIGITAL *Diversions*

The Latest Premium Electronics



CORSAIR VOYAGER AIR

► As far as four-headed monsters go, Corsair's Voyager Air (www.corsair.com) is a scary, scary beast, and that's a good thing. Billed as the world's first "all-in-one portable wireless drive, home network drive, USB drive, and wireless hub," the Voyager Air functions as a traditional USB 3.0 drive, as well as a NAS (network attached storage) device when connected to a home network via Gigabit Ethernet. Home network support also means a user can access content on the Voyager Air via his smart TV, gaming console, or other compatible device. Thanks to integrated wireless abilities and a rechargeable lithium-ion battery, the device can stream media to as many as five devices at once without an Internet connection. After connecting to a public Wi-Fi hotspot, meanwhile, the Voyager Air can share secure Internet access with mobile devices. Models are available in 500GB (\$179.99) and 1TB (\$219.99) versions, and a free app for streaming is also available.

VISIONEER STROBE 400

► As a business user, chances are Visioneer (www.visioneer.com) is a name you recognize. That's because the company has made a point of creating scanners specifically with business use in mind. An example is the new Strobe 400 (\$299.99), a duplex color scanner can generate 600ppi scans of plastic ID cards, business cards, checks, documents, and more. The light-weight portable scanner measures 11.6 x 2.5 x 2 inches (HxWxD) and draws power from a USB port or electrical outlet. Beyond including Visioneer's AutoLaunch technology, which starts a scan automatically upon inserting a document, the scanner comes with Visioneer OneTouch technology (automatically scans a document to your email program, a printer, a file folder, or Microsoft Word with one touch) and Kofax VRS technology for enhancing images as they are scanned.



SONY CYBER-SHOT TF1

► Not all photography is focused on producing fancy product shots taken in pristine studio conditions. Some photo ops require going off the beaten path and heading down trails that are a little more rugged and dirty. For such scenarios there's the Sony Cyber-shot TF1 (\$199; store.sony.com), which is designed for weekend adventures, family vacations, and other excursions. Beyond being waterproof up to depths of 33 feet for 60 minutes, the 16.1MP TF1 is dustproof, shockproof, and freeze proof. To make shooting in harsher elements more convenient, the camera sports large buttons and "beefy" camera grip and also integrates auto brightness for its 2.7-inch LCD screen. Additional TF1 features include 720p HD video (with Optical SteadyShot enhancement) and 360 Sweep Panorama mode, a 4X optical zoom, and built-in Advanced Flash and Beauty Effect (post-shooting editing options) technologies.

Free premium TV is finally here!

With today's technology, there is no need to pay for expensive TV service. In fact, there is a free, web-based TV service that is revolutionizing the way people watch TV: iTVmediaPlayer. It allows you to watch over 200,000 live TV channels, free HD movies and on-demand shows, legally. You can even connect it to your regular TV or use it on other devices, including computers, mobile phones, gaming consoles and tablets.

Unlike Cable or Satellite TV, what people seem to love the most about this free service is the enormous premium content variety and portability it offers. It is great for on the go, long travels, and the home, since it works anywhere in the world.

In addition to live TV, you also get optional access to on-demand content from well-known, web-based providers — including Hulu®, Netflix®, Blockbuster®, YouTube® — all in a single platform.

The service uses your Internet connection — instead of an "antenna" or "satellite dish" — to connect you to the hundreds of thousands of live and on-demand programs. The service is absolutely free. All you really need is the software/app (which runs on all the aforesaid devices).

For more info, a channel list, or to obtain your own copy (for only \$24.99; one-time purchase), visit iTVmediaPlayer.com

iTVmediaPlayer™
Better Premium TV



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TECHNOLOGY FOR BUSINESS



Solve Laptop-Projector SETUP PROBLEMS

YOU'RE READY TO GIVE YOUR presentation, but until that first slide appears on the big screen, you can never be sure that your equipment has got your back. We can't tell you not to worry, but these handy tips should help bail you out if your presentation goes south.

► HARDWARE & CABLE CONNECTIONS

It can be difficult to track down the source of problems that occur when connecting a notebook and projector. Here are some things to watch for.

Video. Turn off all equipment and connect your notebook's video out port to the projector. The usual connection choices for a notebook are VGA (Video Graphics Array), DVI (Digital Visual Interface), HDMI (HD Multimedia Interface), and DisplayPort. Many projectors

have VGA and one or more digital connections. If possible, use a digital connection for high quality.

Sound. Some HDMI and DisplayPort digital video connections can carry audio through the same port, but both notebook and projector must support audio over the digital video connection. Traditionally, audio is connected using the notebook's audio out jacks and the projector's audio in ports; both of these are often RCA or 3.5mm. If you're not using the projector's built-in speakers, make sure you connect your notebook's audio out to the sound system you

If you are using a wireless device, make sure the notebook has the appropriate wireless connection enabled. This is typically Bluetooth or a USB port wireless dongle.

■■■■■■■■■■

intend to use and turn the volume down on the projector's speakers.

Mouse. If you are using a mouse, or a remote mouse controller, make sure the controller/mouse is connected, usually through the notebook's USB port. If you are using a wireless device, make sure the notebook has the appropriate wireless connection enabled. This is typically Bluetooth or a USB port wireless dongle.

► NETWORK CONNECTION

Many venues supply network projectors, which are made available as a

TOP 10 NOTEBOOK-PROJECTOR

Troubleshooting Tips

- 1** Turn off all equipment before connecting the notebook to the projector.
- 2** If possible, use a digital connection to ensure a high-quality presentation.
- 3** If you're not using the projector's built-in speakers, turn them down and connect the notebook's audio out to the sound system.
- 4** If you're using a wireless mouse or controller, make sure you can establish the wireless connection.
- 5** Use the straightforward network connection feature in Win7 to connect to a network projector.
- 6** If there is no video, check all the ports and then check Windows' Screen Resolution settings.
- 7** Out-of-range messages can be solved by adjusting the screen resolution.
- 8** When a projected image isn't proportionally correct, try repositioning the projector and/or changing the projector's keystone setting.
- 9** If a display turns off during a presentation, check the notebook's power management settings.
- 10** If video isn't displaying correctly, change the Display settings to make the projector the primary display.

shared resource. Making a connection to a network projector is as easy as plugging your notebook into the corporate network via wired or wireless Ethernet. Check with the company's IT staff for specifics. Once connected, use the network connection wizard in Windows 7 to find the projector you wish to use:

- Click Start (the Windows button in the bottom-left corner of the screen).
- Click All Programs.
- Click Accessories.
- Click Connect To A Network Projector.
- The network connection wizard may inform you that your notebook's firewall is blocking the ability to connect with the projector. Click to establish the network connection.
- Either have the wizard search for available network projectors or enter the projector's address manually if it is available.

Once connected, a Network Presentation window will minimize to your Taskbar. When you're ready to make your presentation, open the Network Presentation window and select Resume. Your notebook will treat the network projector like an external monitor.

➤ NO VIDEO

In many cases, your notebook will detect that you have a projector plugged into one of its video outputs and will automatically turn on the port. Not all notebooks do this, however; and even those that do can still have missing video if the notebook isn't set to duplicate the Desktop or extend it to the secondary monitor (the projector). Many notebooks use a function key combination to toggle the projector port on or off and set how you can use the display. We recommend using the control panels in Win7:

- Right-click a blank area on the Desktop.
- Select Screen Resolution.
- Select the second display from the drop-down menu.
- Select Extend These Displays from the Multiple Displays drop-down

menu. Your Desktop background should now appear on the projector.

Win7 also has a pop-up display for selecting the content that is sent to the projector. Press the Windows-P keys to bring up the four possible selections:

- Computer only (turns the projector display off)
- Duplicate (mirrors your computer's Desktop on the projector)
- Extend (uses the projector as an extension of your Desktop)
- Projector only (turns off your notebook's display and uses the projector as the main display)

➤ VIDEO IS OUT OF RANGE

When the projector can't reconcile a video signal from a notebook with its preset resolution, it displays an out-of-range message. To solve this in Win7:

- Right-click a blank area on the Desktop.
- Select Screen Resolution.
- Select the display associated with the projector.
- Use the resolution drop-down menu to adjust the resolution to the correct value. Try 800 x 600 or 1,024 x 768 as these are resolutions that many projectors can handle.

➤ DISPLAY TURNS OFF

If the projector's display turns off during your presentation, check your notebook's power management feature, especially if you're running the notebook off of its battery. Whenever possible, use your AC adapter to run your notebook.

➤ VIDEO WON'T DISPLAY OR IS CHOPPY

Your slide presentation works fine, but when you try to show a video, all you see is a blank window or a choppy rendition of the video. Trying to display a video on two monitors can be too much for a video card that has marginal graphics capabilities. If video isn't displaying correctly, change the Display settings to make the projector the primary display. ●



Rootkit Attacks

WHAT TO DO TO FIGHT BACK

EVEN SEEING THE WORD “rootkit” can send shivers up the spine of someone who has suffered through the inconvenience and damage a rootkit can exact. As Dan Olds of Gabriel Consulting (gabrielconsultinggroup.com) says, “rootkits are some of the most insidious and dangerous pieces of malware out there today.” That’s due to the fact that rootkits are both extremely difficult to detect and get rid of completely. Therefore, the more you know about rootkits, the better.

► WHAT IS A ROOTKIT?

A rootkit is software that infects and gains privileged access to a computer. “This means it can perform administrator-level type tasks,” says Michela Menting, ABI Research (www.abiresearch.com) senior analyst. “The primary feature is that it

can hide itself in the system and remain undetected.”

One way to think of how a rootkit wreaks havoc, says Jim O’Gorman, an instructor of offensive security measures, is to envision that you are driving a car but someone else is intercepting all your movements and deciding if he should pass them on to the car or not. “In some cases, he might decide to just insert some of his own commands, as well,” O’Gorman says.

Although rootkits are similar to viruses or Trojans, says Chris Hadnagy, a security training professional, viruses and Trojans usually delete data, stop services, or cause harm while a rootkit provides an attacker system access to get at data. Not all rootkits are malicious (a company might install one to remotely access

and control employee computers, for example), however, Menting says they are “extremely popular with malicious hackers and cyber criminals, which is why they have such a negative connotation.”

► THE DAMAGE DONE

Essentially, rootkits give an attacker free reign to perform any task desired, include installing software; deleting files; modifying programs; transmitting data; and using spyware to steal credit card numbers, passwords, keystrokes, etc. A rootkit’s ability to modify existing programs and processes, says Menting, enables it to avoid detection by security software that would normally catch such software.

“There really aren’t any limits to how much damage it can do to a PC,”

Olds says. "It can delete data files and then rewrite gibberish on the hard drive to ensure that the data can't be recovered, or it can quietly work in the background and log user keystrokes, eventually capturing workplace, e-commerce, or banking usernames and passwords." Ultimately, a rootkit can route that data to a hacker "to plunder accounts or gain access to a corporate network," Olds says.

Beyond software-based rootkits there are hardware-based rootkits, says Hadnagy. "These, like software rootkits, give the attacker full admin access to a machine, compromising everything on it and even at times the network it's connected to," he says. For users, O'Gorman says a rootkit

other programs are running in the background. Menting advises checking the Task Manager to detect which applications or processes are running and using significant memory. "For the non-tech user, it may be difficult to understand," she says. "But users should familiarize themselves with how their Task Manager looks when it's running on a clean system so that when it actually is infected, the user can spot some differences when looking at the tasks."

That said, detecting a rootkit is still generally difficult. This is due to how adept they are at installing themselves and hiding their presence in a way that is "virtually undetectable by your system software," Olds says. "In this case, the only way to find the rootkit

If a user suspects a rootkit, he should first disconnect the system from the Internet to cut off possible remote access and prevent data from leaking, Menting says. Next, remove data from the infected computer and scan it for malware on another device. (Menting notes that if the data contains unknown (or zero-day) malware, this step may not guarantee the malware is eradicated.) Finally, "the computer should be purged—wipe the hard drive and reinstall everything," she says. O'Gorman, in fact, says starting over is the only real solution, because "really, you can't trust cleanup methods, as you are never really sure if they worked."

► HOW TO PROTECT YOURSELF

The first defense against rootkits (and malware in general) is keeping the OS and all software—especially security software—up-to-date and fully patched. Completely relying on anti-virus software is a mistake, however. As O'Gorman says, there's always a lag between the time a new threat pops up and the point at which anti-virus software can detect it. "The best way to avoid issues is to not engage in risky activities," he says. "Run trustworthy, current software that's kept patched. Don't go to shady sites with out-of-date browsers and plug-ins. Don't run software that doesn't come from trustworthy sources."

Unfortunately, "the likelihood of being hacked or unwittingly downloading malware on a computer is extremely high," Menting says. "Especially in the network-connected environment of a company—even if you take all precautions necessary—someone else may not have and you get a virus from them internally." She suggests using different passwords for all logins, encrypting sensitive and confidential data, constantly being on the lookout for odd system behavior, and securing mobile devices if connecting them to a company network or business computer. ●

Rootkits give an attacker free reign to perform any task desired, include installing software; deleting files; modifying programs; transmitting data; and using spyware to steal credit card numbers, passwords, keystrokes, etc.

"destroys all trust with the computer. You can't know what is private, what is not. All integrity is gone."

► HOW YOU'LL KNOW

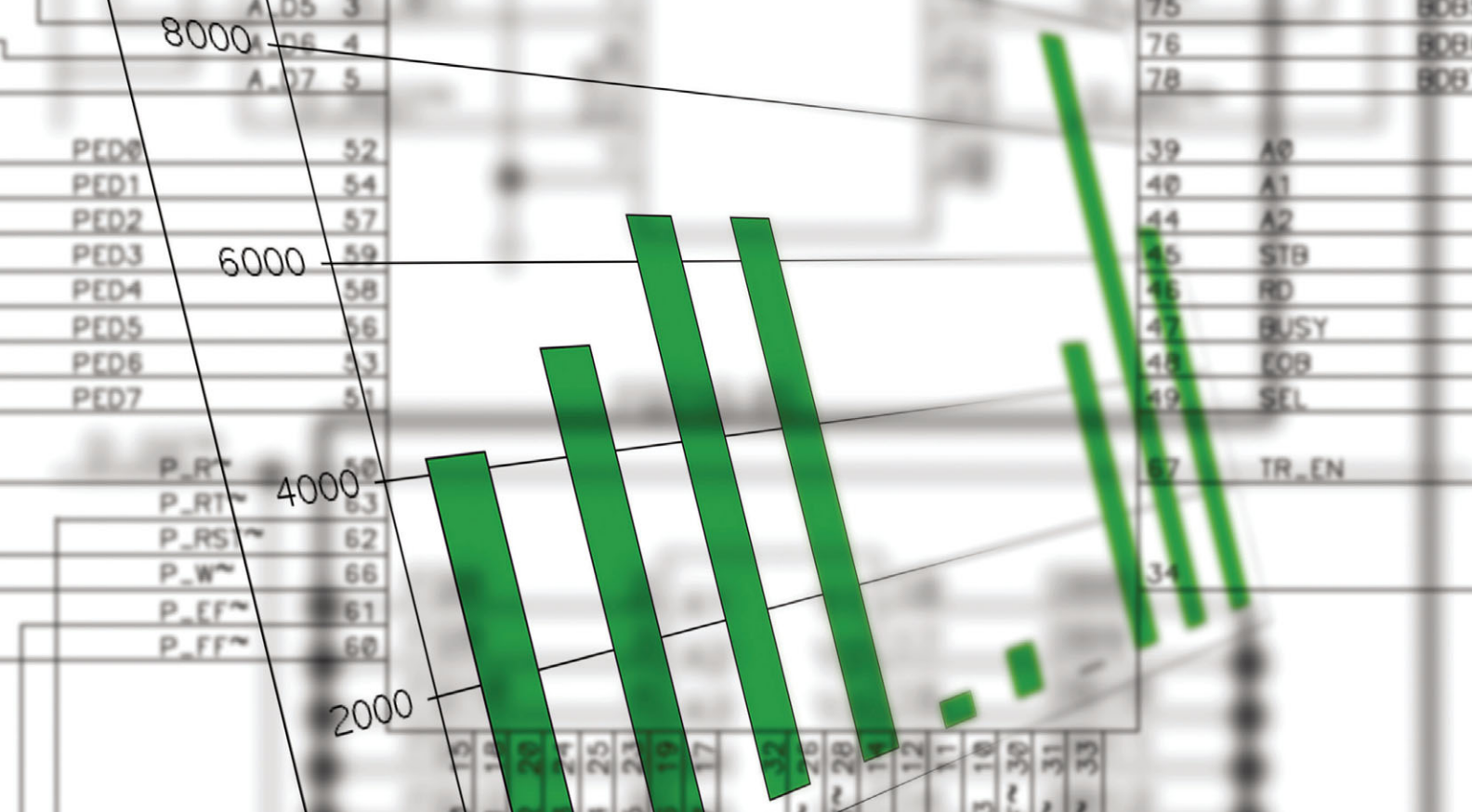
There are several ways a rootkit can find its way into a computer. A downloaded program file a user believes to be legitimate, for example, may have a rootkit embedded within it. Menting says rootkits generally enter a system through existing vulnerabilities and are loaded by malware, which can infect computers via downloads, email attachments disguised as genuine communication or documents, websites with unpatched vulnerabilities, USB thumb drives, or mobile devices.

To the average user, abnormal computer behavior is the best indicator a rootkit might be present; warning signs include files spontaneously disappearing or appearing, a sluggish Internet connection, and slow-loading programs. Such behavior can indicate

is to boot the system using a CD/DVD or thumb drive that has special diagnostic routines designed to find and remove rootkits." Hadnagy says if a system's OS is compromised, it can't be "trusted to find flaws in itself." In this event, it may be necessary to boot a self-contained OS running from a CD/DVD or USB drive and run malware detection and removal software from a "clean" environment.

► WHAT TO DO

For typical users, arguably the worst news concerning rootkits is that getting rid of one can be beyond their scope. Olds says, in fact, most users should probably seek an expert's help if they suspect a rootkit infection. Though some security programs can detect and remove specific rootkits, Menting says, "there are so many variants that it can be impossible to detect and remove them all." Often, she says, getting rid of a rootkit "requires a radical solution."



Excel Formulas MAKE THEM WORK FOR YOU

EXCEL SPREADSHEETS are useful for tracking finances, storing important figures, or even creating databases of information. But the only way to take full advantage of Excel is to use functions and formulas. Whether you simply want to find the sum total of a column of numbers or calculate compound interest, formulas are the best way to transform your data. Here are examples of formulas that might save you time.

► CALCULATE COMPOUND INTEREST

Because Excel doesn't have a built-in function for calculating compound interest,

Excel doesn't have a built-in compound interest function, but you can use this relatively simple function to get the same result.

Microsoft provides a formula that will get you the results you need using present value (PV), interest rate (R), and the number of investment periods (N). So, if you make an investment of \$100 and want to see how much money you'll have in 10 years with a 4% interest rate, you can plug those numbers into the $=PV*(1+R)^N$ formula. In our example, your formula would be $100*(1+.04)^{10}$. Note that you need to change the 4% figure

into a decimal number, otherwise you might expect larger than life return on your investment. Calculate the formula and you'll see that over 10 years your initial \$100 investment will grow to \$148.02.

► CALCULATE PERCENTAGES

You can calculate percentages in a variety of ways using Excel, depending on the information you already know. For instance, you can use a simple division formula to find a comparison between two numbers. For instance, if you shipped 25 products and only one of them was returned, you can simply enter $=24/25$ (or use cell coordinates) to get a figure of .96 or 96%. If you want to calculate change between numbers (200 to 250, for example), you can use the formula $=(250-200)/ABS(200)$ to get a growth rate of .25 or 25%.

	A	B
1	Initial Investment (\$)	100
2	Interest Rate	0.04
3	Time (In Years)	10
4		
5	Total	148.02

► SUM OF TOTALS ACROSS MULTIPLE WORKSHEETS

Let's say you keep track of sales figures over the years using the same Excel document. Not only do you want a record of your current year's sales, but you also want your sales figure from the previous year at the top of each sheet. This will require the use of the SUM function as well as some cross-sheet calculation. Using the SUM function, =SUM(Sheet1!A1:A6) for instance, you can take numbers from the first sheet, add them together, and display them in a cell on the second sheet.

► MATCH FUNCTION

Excel's MATCH function makes it easier to find the location of a specific figure relative to its order in a column. For instance, if you are searching for the number 780 in a column of 30 cells, you can type the formula =MATCH(780,B1:B30,0) to find your exact match. If the information is located in the 15th cell, for instance, you'll receive the result of 15 from the formula. You can also use a 1 or -1 modifier in place of the 0 to find the number that is greater than or less than your desired figure.

► ROUND UP OR DOWN

If you work with figures that have multiple decimal numbers and need to round up or down to a specific decimal place, then Excel has two easy functions you can use to get the job

The MATCH function is helpful if you want to find a specific figure in a long column of numbers. It shows you where your query is located in relation to the array you provide in the formula.

	A	B	C	D
1	Product	# Of Sales		
2	Desktops	267		
3	Laptops	359		
4	Smartphones	780		
5	Tablets	1,898		
6	Printers	175		
7				
8				
9		3		
10	=MATCH(780, B2:B6,0)			
11	MATCH(lookup_value, lookup_array, [match_type])			
12	Finds the largest value that is less than or equal to lookup_value. Lookup_array must be placed in ascending order. 0 - Exact match 1 - Greater than -1 - Less than			

Whether you simply want to find the sum total of a column of numbers or calculate compound interest, formulas are the best way to transform your data.

done: ROUNDUP and ROUNDDOWN. For example, take a number you want to round up, such as 12,345.678 and decide what decimal place you want to round to. Then, use the function =ROUNDUP(12,345.678, 2) and Excel will automatically round it up to 12,345.68.

► WORKDAY FUNCTION

WORKDAY lets you take a start date and a number of days to determine what your end date will be with weekends and holidays taken into account. For example, you need to enter the DATE formula, we'll use =DATE(2013,1,3) into the A1 cell, and a specific number of days in the A2 cell, we'll use 18, you can use the formula =WORKDAY(A1, A2) to find your end date, which in this case is March 27, 2013. You can also add holidays to the formula by entering the dates into cells

and adding them to the end of the formula =WORKDAY (A1, A2, A3:A9), which will change the end date.

► DISPLAY CURRENT DATE & TIME

Excel's NOW function is a quick and easy way to display the current date and time in your spreadsheet. Type =NOW() into a field and the date and time will appear. This information doesn't update automatically, but rather every time you make a calculation within the spreadsheet as well as every time you open that particular Excel document.

► REPT FUNCTION

Typing the same thing over and over can quickly get repetitive, especially if you need 32,767 instances of the same information. If you think that number is oddly specific, you're right. It's the maximum number of times you can use the REPT function, according to Microsoft. To use the REPT function, simply take a word, number, or other entry ("Repeat," in this instance) and tell Excel how many times you want it repeated by typing =REPT("Repeat",5) into a cell. You can also use this function to better visualize data. For instance, you can use symbols to represent sales figures or your amount of customers and watch your growth over time. ●

	A	B	C
1	100		
2	200		
3	300		
4	400		
5	500		
6	600		
7			

Cross-sheet calculation makes it possible to link formulas across multiple sheets in the same workbook, so you don't have to copy and paste information or calculate figures outside of Excel.

	A	B	C
1	Total		
2	2100		
3	=SUM(Sheet1!A1:A6)		
4			
5			
6			



Mobile Data Best Practices **SYNC & BACKUP OPTIONS FOR YOUR TRAVELS**

THE THEFT OR LOSS OF A LAPTOP, tablet, smartphone, or other mobile device ranks among the worst productivity catastrophes that can befall a traveling professional. For all intents and purposes, our devices are our offices when we travel, and losing them disrupts our ability to work and communicate. There is an obvious financial hit associated with the loss of hardware, but there is a potentially greater hit that occurs in the loss of corporate data. It's important, then, to know where your data is at all times, so in the event that you no longer have access to your devices, you'll know what is lost and what is accessible elsewhere. And, if you follow a few mobile best practices, you'll never

have to worry about losing much data at all—if any.

KNOW WHAT GETS BACKED UP AUTOMATICALLY

► Depending on your smartphone's or tablet's operating system, there is a certain amount of device data that automatically gets backed up on a regular basis. If you use a USB cable to directly sync your iPhone or iPad with your computer, for example, the sync process backs up all of the OS and app data stored on that device; there is an option to encrypt and password-protect the backed-up data, too. If you use the iCloud service with your iOS device, specific sets of data will automatically

get backed up in the background as long as your device has a Wi-Fi Internet connection, is plugged in to a power source, and has a locked screen; backed-up data can include camera roll images, documents, audio, and settings, depending on the options you choose.

Android users can manage incremental backups for apps and device settings by signing into the associated Google Account from the smartphone or tablet. The Android Auto Sync feature routinely syncs in the background; how and what it syncs partly depends on the options you choose, but by default the feature backs up OS data, contact information, documents, and select app data (such as Facebook and Twitter).

If you have a device running one of the latest versions of Windows Phone, you can sync documents stored on your device with Microsoft's SkyDrive cloud storage solution; you can also retrieve documents from SkyDrive that were uploaded from a different source. To sync all of the photos, audio files, and videos stored on your Windows Phone device, you must install Microsoft's Zune software on your computer and connect the mobile device to the computer via USB.

DON'T FORGET YOUR APP DATA

► "App data" encompasses a broad range of digital information, but in our context it means third-party apps and the content you create using those apps. Consider, for instance, note-taking services that exist as both cloud services (where all of the information associated with those services is stored in the cloud) and applications (where your app-related information is stored locally). As you take notes with the app, the app stores your notes locally and in the cloud simultaneously and in real-time. Such an app-service combination is different from a note-taking app that does not have an associated cloud service; with this type of app, everything you add is stored only in the device and is therefore vulnerable to loss. Make sure you know how your apps work so you don't get caught unawares.

Also keep in mind that some apps are more flexible than others. Apple's Notes app in iOS, for example, can keep your notes on the device only or on both the device and in the cloud, depending on how you set it up.

BE CAREFUL WHEN TRAVELING

► If you travel frequently, you probably have quite a few travel-related routines. When it comes to keeping all of your data intact, though, it's important to remember that travel disrupts the routines you've established at the office. For example, if you regularly sync your tablet and smartphone with your computer but typically leave the computer behind when traveling, the backup that otherwise occurs with every physical sync won't take place during your travels. If you keep that sort of thing in mind while traveling, you will remain aware of what data resides in the "danger zone" (i.e., stored on your device, but not backed up anywhere else) in the event your device gets lost or stolen.

USE CLOUD SERVICES, AT LEAST TEMPORARILY

► If you're reluctant to sync key data to a cloud backup or storage service on a regular basis, consider using an alternative cloud solution—at least temporarily—to meet specific requirements while traveling. For example,

you could set up an account with a major online storage provider to use with only a handful of files that are necessary for a specific trip. Providers offering this type of service typically also offer a mobile app that makes the service more useful on your mobile device. And some major storage services also sync with productivity apps you might already have installed on your devices.

Another stop-gap alternative is to use a Web-based email service to email documents to and from a corporate account. Doing this ensures that a copy of the document is maintained on the corporate network even after you delete the associated email from the Web email account.

PHYSICAL BACKUP

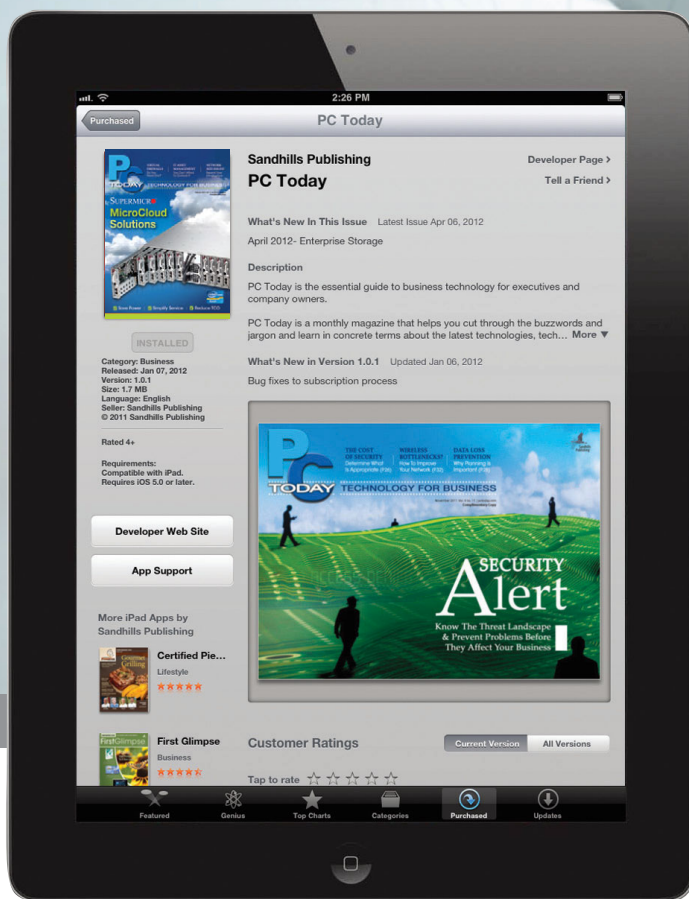
► Finally, you can't sync a certain amount of valuable device data to the cloud (or to your main computer via the cloud), be sure to back up that data as often as possible to a second device (such as a laptop) or storage solution (such as a microSD card or portable hard drive). ●



► To locate the Storage & Backup menu on your iOS device, tap Settings, iCloud, and Storage & Backup. From this screen you can view available storage and switch iCloud off and on.

◀ You can customize which apps are backed up in iCloud by toggling the ON/OFF button next to each app. Be sure to activate the Find My iPad feature in case you need to locate a lost iOS device.





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